FIELD TRAINING-

SIGNALLING

AMERICAN EDITION

EDITED BY

CAPTAIN E. J. SOLANO

1918

HARVEY MILITARY SERIES

FIELD TRAINING—SIGNALLING

AMERICAN EDITION

ATTACK, DEFENSE, OUTPOSTS, SCOUTING, FIELD SKETCHING, NIGHT OPERATIONS, STATION WORK, DESPATCH RIDING, TELEPHONES, MAP READING

Edited by

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CONTENTS

FIELD TRAINING

Chapter I

Preliminary Instruction

Chapter II

Attack and Defense

CONTENTS—Continued

Chapter III

Infantry Outposts

Chapter IV

Elementary Night Operations

Chapter V

Infantry Scouting

Chapter VI

Fighting in Close Country, Woods and Villages

SIGNALLING

Chapter I

Messages

Chapter II

Station Work

Chapter III

Despatch Riding

Chapter IV

Map Reading

Chapter V

Cable Telephone Drill

CAPT. E. JOHN SOLANO

The Famous Military Author

Capt. E. John Solano is recognized as one of the greatest authorities writing on military training subjects, not only in the British Empire, but around the world. Wherever military men congregate the name of Solano is known and respected. No officer questions the fact that he speaks with authority, for they know that his books have had the greatest influence on British tactics and methods of training since before this war started. The American editions of his books, printed exclusively in this country by the George U. Harvey Publishing Company, Inc., New York City, have been used with great profit in every camp and have influenced training methods more than the work of any other foreign military authority.

The leaders of the American Army have studied and applied the methods advised by Capt. Solano, for they knew that theoretically he was sound, and that his intimate association with the British War Department and his actual experience in the Front Line has made whatever he wrote the last word in military authority.

The particulars of Capt. Solano's personality and public work will be interesting to the readers of his books in this country. His family was a pioneer in the development of the Indian Empire, and for a century has owned one of the largest estates in India. The family is of Spanish descent and claims connection with many men who have helped in the past to make the history of the American Continent as sailors, soldiers and explorers, including a member of Columbus' staff on his immortal voyage of discovery, named

Alvarado, and Saint Francisco Solano, a Carmelite priest subsequently canonized, who was one of the pioneers of Christianity in the Western Hemisphere. Capt. E. J. Solano was educated at Rugby School.

Capt. Solano began his public work in 1903 with the authorship of a series of political articles contributed to Blackwood's Magazine, the National Review and Mr. John Murray's Monthly Review, dealing with current problems of Asiatic and European international policy dating from the events which led to the invasion of Thibet and the capture of Lhassa by a British Expeditionary Force. He strongly advocated the policy of Lord Curzon as Viceroy of India in regard both to domestic and foreign affairs. In the course of his study of European political conditions he was present in Russia for some months after the fall of Port Arthur and was an eye-witness of the events of Red Sunday and of the revolutionary movement in Petrograd, where he made friends with some of the present leaders.

In British domestic politics he was among the first to join Mr. Joseph Chamberlain in his tariff campaign and his movement for imperial consolidation. Capt. Solano is a vice-president of the Tariff Reform League, and his candidature for Parliament as a Unionist member was recommended to the party organization by Lord Curzon and Lord Milner.

Capt. Solano was among those who became convinced some years ago that the present war was inevitable. He accordingly abandoned his Parliamentary ambitions to devote himself to the solution of certain vital problems of national defence connected chiefly with the development of British military power. He joined the late Field Marshal Lord Roberts in his movement for national service. He invented the Solano target, which was adopted by the British War Office, and which has been used to train the British armies in the present war. He also foresaw the great difficulty which would arise in rapidly training both officers and men—especially the former—from the mass of a civilian population on the outbreak of war unless the whole problem of military training was considered in special relation to this difficulty.

Four years before the war Capt. Solano began writing and editing a series of manuals, known as the Imperial Army Series, with the special object of facilitating the rapid training of citizen soldiers. These books have had an immense sale throughout the British Empire and have been used extensively for the training of the British Imperial Forces. He has made a special study of the training of boys in military cadet corps as the true foundation of the future democratic armies in great industrial countries, and has paid special attention to the development of national physique in two volumes of the Imperial Army Series as being the basis not only of military training but also of national health and physique in both sexes.

Capt. Solano is the author of the principal military article in the Year Book published in 1913 by the Encyclopedia Britannica. In this article, entitled "The World's Armies," he foreshadowed with curious accuracy many of the developments of the present war, including the violation of the neutrality of Belgium and the influence of British sea power upon the struggle.

Capt. Solano was one of the first men to volunteer on the outbreak of the present war and served on the Western Front for over a year. His division was holding part of the line when the Battle of Loos was fought, and it took part in the Battle of the Somme, capturing Contalmaison, smashing up the famous attack of the Prussian Guard on that position. He subsequently took part in the operations which resulted in the capture of Pozieres by the Australians and was invalided home shortly afterwards as the result of an injury. His books, therefore, bear the imprint of practical experience as well as long and thorough theoretical study.

CAPTAIN E. J. SOLANO.

FIELD TRAINING

CHAPTER I

PRELIMINARY INSTRUCTION

Section 1.—General Remarks on Field Training

1. When the recruit has been trained in close and extended order drill, his training in the field will be commenced. This instruction will combine training in the use of ground and cover, fire discipline and tactics, and the use of the spade with training in manœuvre. Instruction should be carried out indoors by means of lectures as well as on the ground. Units should be exercised in methods of attack and defence and the various duties of outposts, first in sections and platoons, and then in companies.

2. Company commanders will devote special attention to the training of platoon and section commanders in grasping situations rapidly and in issuing clear and suitable orders quickly. Special attention will also be devoted to the orderly continuance of operations after units have become mixed and commanders incapacitated. Men must be practised in performing their duties without leaders, and they must be taught in case of confusion, as the result of which they become separated from their commanders and units, to place themselves under the orders of the nearest commander.

3. In all stages of training *advantage should be taken of local conditions to teach those lessons for which the ground is best suited.* Schemes for company training should be simple, and should usually deal with the various situations

which would concern a company when operating with the remainder of a battalion. In later stages of company training situations should be worked out to their logical conclusion, and units should be practised in delivering and receiving the assault, the pursuit,, and in assuming the defensive from the offensive. Field exercises will be carried out under service conditions as regards equipment, unless climatic conditions make this inadvisable. Blank cartridge will be used in practising the more advanced exercises.

4. **Instruction of Recruits.**—(i) Recruit exercises in attack and defence may at first be confined to frontal movements, with the object of simplifying instruction. Flank movements tend to elaborate and complicate exercises, and it is a question for the discretion of instructors whether they should be attempted by recruits. Such movements if carried out at all should be extremely simple, their object being clearly explained. The field training of recruits should be limited to the duties of the firing line and supports, to ensure that the whole unit is employed so as to get the best advantage from instruction. The duties of reserves, if practised at all, should be confined to exercises in local counter-attack. Field exercises for recruits should be confined to applying clearly defined principles to simple, easily understood situations on the ground.

(ii) **Fighting in Close Country, Woods, and Villages.**—In many parts the field training of recruits will be carried out entirely in typical close country, and instructors, when they are satisfied that the general principles of attack, defence, and outpost work have been mastered by recruits, should teach them, through practical and simple schemes, to apply these principles to fighting in close country according to the instruction laid down in *Infantry Training* and in Chapter VI of this book.

Great care must be taken to distinguish between general principles and those which apply especially to fighting in close country, so as to avoid the danger of confusing the men and teaching false lessons. Faciiities for training recruits

in wood and village fighting will not be so easily available as facilities for training in close country, and street fighting will lie outside the scope of their instruction. When, however, facilities for it are available, elementary instruction may be carried out in wood and village fighting according to the principles laid down in Chapter VI of this book.

Section 2.—Indoor Instruction

1. (i) **Lectures.**—Indoor instruction will consist of a course of short, simply expressed lectures given in the evening or at any convenient time. Lectures must be made interesting and attractive. Their object is to give every recruit, irrespective of rank, a clear idea of his duties in the various branches of training in this book and a thorough grasp of the broad principles of infantry tactics which he will be taught to apply in practice through field exercises.

(ii) **Discussions.**—Instructors should initiate discussions upon points in their lectures and encourage the men to express opinions upon them shortly and concisely.

2. **Landscape Targets.**—(i) Lectures may be illustrated whenever possible with the aid of the official standard equipment for miniature ranges in the Army (the Solano Target Apparatus).

For example, information regarding the formations usual in different stages of an attack, the influence of ground upon both formations and tactics, good and bad halting-places in attack, the use of ground and cover in defence, and the control and direction of fire can be clearly given by practical illustrations. Military vocabulary can also be taught, together with the correct terms for various natural features of country.

(ii) **Method of Demonstration.**—The following is an example of the method of illustrating lectures by landscape targets. The instructor, having prepared his lecture, should decide the points which can be illustrated effect-

ively, and the manner in which he intends to illustrate them. It may be supposed that he wishes to illustrate the formation usual in different stages of an attack or the proper adaptation of formations to ground under different conditions. Before the lecture commences he will select his scenery, scenic accessories, and Solano figures, and arrange them on the Solano Apparatus with the mechanism fitted to expose the troops or to conceal them till he desires to expose them.

(iii) If other landscape targets are used he may fix the figure targets to the landscape with drawing-pins, and place it where it can be seen easily by the whole class. In either case, by this arrangement he can illustrate the points of his lecture without trouble or loss of time. The instructor should always arrange to have some time at the end of the lecture to make sure that the lesson he sought to teach by the illustration has been grasped by the men. With this object he should question them, for instance, as to the reason why a particular formation is adopted on the ground at a particular place in the landscape, and why it is modified in another place. Alternatively he may devote a short time to making the men write a concise account of the points he has made with the help of the illustration.

(iv) When they have grasped the broad principles which govern formations in different stages of attack sufficiently well the instructor may purposely make mistakes in his illustrations, using wrong formations with regard to the nature of the ground and the stage of attack. He should then invite the men to criticise the illustration, point out the mistakes and rectify them. He may also vary instruction by calling upon the men in turn to fix figure targets upon a part of the landscape in the proper formation after telling them the stage of the attack in which it is employed, but leaving them to use their judgment in adapting the formation to the nature of the ground.

3. **Blackboard.**—When landscape targets are not avail-

able a blackboard may be used to illustrate the lectures with rough drawings and diagrams in chalk.

Section 3.—Instruction on the Ground

1. **The Problem of Ground.**—(i) The study and use of ground is the foundation of field training. Commanding officers should make every effort to procure suitable ground in the vicinity of their commands, and to vary the ground as frequently as possible. Even when facilities in the shape of ground are restricted much can be done with a little ingenuity to make the most of what is available.

(ii) **Varying the Ground.**—For example, a piece of ground may be made to provide considerable variety for the purpose of instruction if an operation is carried out over it in a different direction every time it is practised. Unless the ground is particularly flat and naked, even a slight difference of direction may alter its character considerably in relation to a given tactical situation.

(iii) **Advantages of Varying Ground.**—Experience from training over a variety of ground will teach recruits the necessity of a careful study of ground. They will learn that even on similar types of ground the features are never quite alike, and that *they must always adapt their movements and actions to suit the changing nature of the ground according to correct principles of the science of war. Instructors will be able to impress upon recruits from the commencement of their training that the principles of war are not fixed rules to be committed to memory and applied rigidly to every situation without regard to special circumstances in each case, but that they are more or less elastic, and must be adapted with intelligence and judgment to ever-varying conditions.*

2. **Tactical Situations.**—(i) *Instruction on the ground must always be carried out in relation to a definite, simple and clearly understood tactical situation.* In arranging situations the ground and weather conditions must, of course, be

taken as they exist but the manner in which the enemy's position is indicated, and the action of his troops represented will give plenty of scope for the imagination and ingenuity of instructors. The greatest care must be taken by instructors to avoid teaching false lessons, as, for instance, through the position chosen as occupied by the enemy, through the action of his troops, or by any other detail.

(ii) **Representing the Enemy.**—In every tactical situation the enemy should either be represented by recruits, or his position be indicated in some suitable manner. This can be done by dividing recruits into two opposing forces or employing them as a while against a skeleton force of a few men. Alternatively, a definite, easily recognized tract or feature of country may be indicated as occupied by the enemy, or, his position may be defined by a few small white flags, or sticks, to which sheets of white paper are securely fixed.

3. **Training by Demonstration.**—(i) The instruction of recruits on the ground should be carried out throughout upon the principles of demonstration—that is, by practical examples. This method of teaching is simple as well as practical and interesting to those under instruction, and it has the further advantage that mistakes are easily indicated and are often self-evident as soon as they are made. Training by demonstration requires forethought and careful preparation on the part of the instructor, which, however, will be repaid by the saving of time and trouble, as well as by good results in training.

(ii) **Preparation by Instructors.**—Before an exercise is begun the instructor should, whenever possible, arrange how he will indicate the tactical situation upon which it will be based, together with the details of the evercise on the actual ground over which it will be carried out. This will necessitate a previous study of the ground with relation to the lessons he wishes to teach by the exercise, and careful consideration of the methods by which he will demonstrate these lessons to cadets through practical examples.

4. **Method of Demonstration.**—(i) When recruits are on the ground ready to begin the exercise the instructor will first clearly explain to them the nature and exact object of the operation they are to carry out, and indicate the position of the enemy. He should in the earlier stages of training, and so long as he considers it necessary, explain to the men as shortly as possible the correct principles and methods by which the operation should be performed, dealing with the duties of both officers and men. *In every case he must make sure by questioning them that recruits understand his directions.* The instructor should occupy a minimum amount of time with these preliminaries, and avoid keeping the men standing about longer than is necessary, so as not to tire them, and to prevent the risk of chill if the weather is inclement.

(ii) **Training Two Units Together.**—In carrying out training by sections it will prove advantageous, and economize time, ground and the work of instructors if one section is made to attend and watch the practical instruction of another section on the ground. This method will double the benefit of training, for recruits, in watching the work of their comrades, will learn much from seeing the manner in which they perform their duties, and by listening to the directions and criticism of the instructor, who may also invite opinions from them. They will be shown correct methods, and learn to recognize and avoid mistakes by seeing others commit them.

5. **Examples of Demonstration.**—The following simple examples of training by demonstration are given as a rough guide to instructors.

(i) **Attack.**—*Method of Advance.*—It is supposed that recruits in a firing line are about to advance from a halting-place about 750 yards from the enemy's position. The ground to their front is open and slopes gently downwards for 100 yards, and then rises from a hollow up a convex slope to the crest of a ridge about 600 yards from the enemy's position. The instructor will explain that the advance will be as-

sisted by covering fire from artillery and supports, and opposed by the enemy's fire. He will explain that the open downward slope affords no good halting-places at which the firing line can reply to the enemy's fire, so that the ground must be traversed as rapidly as possible to minimize the effect of his fire.

Upon reaching the hollow at the foot of the slope the whole line may advance simultaneously up to the ridge, this being possible because they are upon what is known as *dead ground.* If the exercise is to include a further advance beyond the ridge the instructor may continue his explanation, and consider its value as a halting-place and the method in which the advance beyond it should be carried out before the exercise begins, or he may postpone considering these points until the ridge is about to be occupied.

Having completed his explanation the instructor will order the recruits to advance. He will accompany them and either criticize their work from time to time as necessary, or reserve criticism till the exercise is finished. If, however, a unit attends to watch the work of the unit carrying out the exercise, the work should be criticized for their benefit as it is being done. As the men progress in knowledge the instructor should make them consider the method of advance, without previous explanation on his part by questioning them regarding the correct use of the ground. In every case recruits should be made to state the reasons for the opinions they express, and these opinions should be criticized helpfully and sympathetically by the instructor. Finally, recruits may be made to advance without any previous explanation or consideration of the various problems involved, their work being criticized by the instructor at the end of the exercise.

(ii) **Defence.**—*Choice of Position.*—It is supposed that recruits are part of a force acting on the defensive. The instructor will indicate the direction from which the enemy will advance and call on his men to choose the best position for defence afforded by the ground according to the directions laid down in Section 11. Recruits must give their

reasons for selecting any position in preference to others which may be available. If two units are being trained together, the instructor will call on the men of the second unit to choose an alternative position against an enemy advancing in the same direction as in the former exercise. He will then discuss the respective merits of the two positions, and if a better one is available under the circumstances, he will indicate it and discuss its merits as compared with the respective positions selected by the cadets.

6. **Supervision of Training.**—Throughout field training assistant instructors should be employed to supervise and criticize the work of the men. For instance, during exercises in Attack, Defense, Outposts, and Scouting, one or more supervisors may be stationed in the direction of the enemy's position to watch and to report faults, such as movements carried out wrongly, or unnecessary exposure either during movements or when in occupation of cover. The fact that their work is actually under observation by the "enemy" will bring an element of reality into exercises and stimulate recruits to do their best, more especially in the case of sentries, patrols, scouts, and those employed on reconnaissance. Trained men, supplied with field glasses may be employed to supervise field exercises.

7. **False Lessons.**—(i) The danger of teaching false lessons is always involved in peace training, because its conditions are more or less artificial. This is especially the case with recruit training, which is limited in scope and is carried cut by small isolated units on restricted areas of ground without the co-operation of air-craft, cavalry and artillery, while the work of strengthening positions both in attack and defence and improving the field of fire (see *Field Entrenchments* of this series) will not as a rule be attempted.

(ii) In explaining the nature of an exercise before it begins, instructors should always deal with each unit as part of a larger force, and with each exercise as part of the general scheme of an operation as shown in the example of an order for attack, Sec. 8. With regard to the details of exer-

cises, instructors must be careful to avoid teaching false lessons, especially in connection with fire positions, formations, methods of advance and the use of ground and cover. When possible the probable effect of artillery fire in supporting and opposing infantry should be explained before a movement is begun or a fire position chosen, so that this important element may be kept in view and due allowance made for it.

(iii) Great care must also be taken to avoid false lessons, not only from halting-places selected by recruits, but from those indicated as occupied by the enemy, as for instance, open ground at the edge of a wood, which should be avoided as providing a good aiming mark for the enemy's fire, while providing no cover affording protection from its effects. It is impossible to do more than call attention very generally to the question of false lessons, but it is obviously of vital importance, and should engage the careful attention of instructors whose task in this respect will be facilitated if training is confined to simple exercises free from elements of complication and difficulty.

Section 4.—Intercommunication and Passing of Orders

1. *All subordinate commanders are responsible for keeping their respective superiors, as well as neighboring commanders, regularly informed of the progress of events and of important changes in the situation as they occur.* All ranks should notice what takes place within their view and hearing, and report anything of importance accurately and at once to their immediate superior, who must pass the information on to the higher commanders and to neighboring units. *This is the foundation of co-operation in war and is essential not only in battle but at every stage of a campaign.*

2. The senior in any body of troops is responsible for forwarding messages to their destination. During an action every company commander will leave with the battalion commander one man of his company who can be trusted to carry a verbal message or order correctly and to describe

intelligently the local situation. These men will be used to convey urgent orders to the companies in action, when this is possible. Similarly each battalion commander will send a representative of his battalion to brigade headquarters during an action.

3. *Within the battalion, orders and messages in battle will normally be verbal.* Verbal initial instructions by a commander on the battle-field should conform generally to the accepted type of written orders. They should give first such information of the enemy and his own troops as may be necessary, then his task, and the general manner in which he intends to carry it out, and after that, detailed orders for the units at his disposal. *The importance of giving orders in a calm, determined manner cannot be exaggerated.*

4. The passing of verbal orders and messages is to be reduced to a minimum owing to the liability of errors in transmission. In the firing line all verbal messages necessary must be passed as quietly as possible, as a rule from section commander to section commander. The fewer the individuals by whom the message has to be repeated, the less chance will there be of errors creeping in.

5. Throughout an action all commanders should try to anticipate the various situations which may occur, and should decide what steps they would take to meet them. They will thus be better able, when the necessity arises, to issue orders promptly and with decision.

6. When the enemy's fire is severely felt, the use of both messengers and signalling may become impossible. Co-operation will then depend upon the watchfulness of officers, especially those superintending the fight in any part of the field. If officers are alert to act on indications expressed by the movement, or absence of movement, of their own troops or of the enemy, and if their tactical training has been conducted on sound and uniform principles, suitable action will follow in spite of the breakdown of positive methods of intercommunication.

Section 5.—Fire Direction and Fire Control

1. Preliminary Training.—Before the training in the fire control can be carried out, it is necessary for men to be instructed in *the theory of individual and collective fire; in military vocabulary; visual training; the description and recognition of targets; judging distance; fire discipline and the various duties of both leaders and men in controlling and directing fire.* They should also have been taught *to load and aim correctly and to adapt the different firing positions to various forms of cover.* This instruction is laid down in the *Musketry Manual* of this series, which includes individual and collective field practices arranged so that they can be fired on 25-yard miniature ranges with the .22 cartridge by the use of the Solano Targets and Landscape Targets.

2. **Direction and Control of Fire.**—Fire is said to be *directed* by the commander who defines the objective against which it is to be used, and to be *controlled* by the fire-unit commanders who give the necessary executive words of command. In attack, occasion will frequently arise when fire-unit commanders must both direct and control the fire of their units, while at close ranges or when men are widely extended, it may happen that the transmission of any fire order is impossible, and that each individual man must control his own fire. *The normal infantry fire-unit is the section, though under certain conditions at the longer ranges the fire of a platoon or even a whole company may be controlled by its commander. The efficiency of section commanders is therefore of paramount importance.*

3. **Fire and Movement.**—The direct object of fire in the case of attack and counter-attack is to facilitate movement, and also to check or hinder the movements of the enemy. *Fire, therefore, is related to movement, and its proper application with respect to movement is one of the principal objects of training in fire control.* Fire should rarely be opened by infantry in attack when satisfactory progress can be made without it. The leading troops in particular should

save every possible round for the final struggle for superiority of fire at close range, as the replenishment of ammunition in the firing line at that time will be a matter of considerable difficulty. When progress is no longer possible fire should be opened, either by such parts of the firing line as cannot advance, or by bodies of infantry specially detailed for this purpose, to enable a further advance to be made. Subject to these principles fire may be opened in attack when there is a probability of its producing good effect, or when withholding fire might lead to heavy loss.

4. **Individual and Collective Firing.**—(i) Within close range or 600 yards fire is usually delivered by *individual firing.* When men fire individually each one selects his target, estimates the range and regulates his own fire. At ranges beyond and sometimes at ranges under 600 yards fire is delivered by *collective firing.* In collective firing a body of men fire as directed by their leaders, who select targets, give ranges, and control fire as to rate, etc. *However skilful individual men may be as marksmen, the greatest effect is produced by their fire only when it is efficiently directed and controlled.*

(ii) **Distributed and Concentrated Fire.**—Collective firing is *concentrated* or *distributed* according to the nature of the target—for example it is *distributed* in firing at a line of men in extended order, and *concentrated* in firing at targets such as a machine gun. It is usually necessary to keep the enemy's firing line under fire throughout its length in order to disturb his aim and prevent his movement, but against very vulnerable targets, or to produce an increased effect at a particular place, fire may be concentrated with advantage.

(iii) **Oblique or Enfilade Fire.**—Oblique or enfilade fire has greater moral and material effect than frontal fire, for it comes usually from an unexpected direction and the target presented to it is generally more vulnerable. In defence, opportunities for the employment of enfilade fire may be created by careful prearrangement between the commanders of adjoining units.

(iv) **Volume of Fire.**—In deciding on the volume of fire to be directed against the enemy at any particular time a commander should consider chiefly the tactical situation, the target presented, the effect it is desired to produce, the range, and the state of the ammunition supply.

5. **Duties of Fire-unit Commander.**—*The efficiency of section commanders as the normal fire-unit commanders is of paramount importance.* The value of a fire-unit commander depends upon his ability to apply the fire of his unit at the right time and in the right volume to the right target. In addition to his other duties the fire-unit commander is responsible for:

(i) Indicating targets.
(ii) Issuing orders for sighting, and when possible, supervising the correct adjustment of sights.
(iii) Regulating the volume of fire; whether deliberate or rapid.
(iv) Reporting when ammunition is running short.

6. **Opening Fire.**—When from his position it is possisible for him to do so, the company commander decides as to the time for opening fire, subject to such orders as the battalion commander may issue, and regulates the supply of ammunition. In the defence he also normally arranges for the distribution or concentration of fire, and indicates the targets generally to his subordinates; but in attack these duties will usually develop upon the subordinate commanders with the firing line. The following considerations must be taken into account in deciding when to open fire:

(i) The early opening of fire discounts surprise and, whether in attack or defence, often indicates the positions of troops which would otherwise be unnoticed by the enemy. In attack it may unnecessarily delay the advance.

(ii) Beyond 1,400 yards the fire of even large and well controlled units of infantry has seldom much effect upon the decision of the struggle for superiority of fire. Exceptional circumstances, such as the appearance of con-

siderable bodies of the enemy in vulnerable formations, may, however, justify the use of long range fire, especially in the defence.

(iii) Between 1,400 and 600 yards, carefully controlled collective fire produces better results than the uncontrolled fire of individual men, *which ceases to be sufficiently effective beyond ranges of about 600 yards* to counterbalance the expenditure of ammunition involved.

7. **Fire Discipline.**—A high standard of fire discipline in the men is not less important than skilful direction and control of fire by the commanders. Fire discipline means strict attention to the signals and orders of the commander, combined with intelligent observation of the enemy. It insures the careful adjustment of the sight, deliberate aim, economy of ammunition. and prompt cessation of fire when ordered or when the target disappears. It requires of the men endurance of the enemy's fire when no reply is possible, and a cool and intelligent use of the rifle when superior control can no longer be exercised.

8. **Fire Orders.**—(i) The words of command for controlling fire are as follows: AT (giving the number of yards) —AT (describing the target)—FIRE OR RAPID FIRE—CEASE FIRE—UNLOAD. During field training the commands for fire control should be combined with those for movement, as in the following example given to a section in fours: *Section. Line that ridge—To the left 3 paces extend—At 1,000—At the enemy just left of that haystack on the hill half left—Fire—Cease Fire—Advance.*

9. **Rate of Fire.**—(i) The ordinary rate of fire for cadets in field training should be slow, to insure that they do not slur the actions and contract bad and faulty habits in loading and firing. About three rounds a minute may be taken as an average rate of slow firing with a modern rifle. *Fire should, as a rule, be delivered deliberately, each man satisfying himself that every time he presses the trigger he will hit the object aimed at.*

(ii) **Rapid Fire.**—*Rapid fire should be considered as a reserve of power to be used when the occasion demands it.* It must combine accuracy with rapidity and never degenerate into a wild expenditure of ammunition at the fastest possible rate. Rapid fire may be required when it is necessary to beat down the enemy's fire quickly; when covering the withdrawal of other troops; when pursuing an enemy with fire; when meeting cavalry attacks; or when good targets are exposed for a very short period; also, in attack, by all troops, as a final preparation for the assault, and in defence to beat off an enemy in the act of assaulting.

(iii) **Surprise.**—The effect of surprise by a sudden burst of accurate fire from an unexpected quarter is very great. Short bursts of rapid fire, followed by pauses, favor observation of results and give time for the adjustment of sights. They also facilitate the control of fire in critical situations. The duration of such bursts must be strictly controlled, and limited to the requirements of the occasion, for if rapid fire is continued for any length of time it excites and exhausts the troops and leads to waste of ammunition.

A sudden effective fire is known to have a particularly demoralizing effect on the enemy; it is often advantageous therefore to seek for surprise effects of this sort by temporarily withholding fire. Wild, unsteady fire causes little or no loss, and tends to encourage the enemy by inducing a belief in his mind that his opponent is shaken. It is therefore worse than useless against good troops. *Every available means should be used to obtain the correct ranges.*

10. **Observers.**—Observers will be employed, as necessary, to assist in the observation of fire, in watching the enemy and neighboring troops, and in keeping up communication between platoons.

11. **Instruction of Recruits.**—(i) Instructors must be careful to see that recruits, in obeying fire orders, carry out the loading motions, fix sights, and aim correctly. The men must be trained *to watch the front and remain alert and attentive while awaiting orders. They must be taught*

to open fire smartly when ordered to do so on such fleeting targets as troops in movement, and to continue firing, unless otherwise ordered, while they present a favorable target during movement. They must also be taught when employing individual fire on the defensive, especially at shorter ranges, *to mark down troops by noting their positions on the ground or behind cover and to open fire the moment they rise up to advance.*

(ii) They must be taught to fire from different forms of cover correctly, always remembering that the most important requirement when firing from behind cover *is the ability of a man to use his rifle to the best advantage, and that the eyes must be kept on the enemy between shots* to avoid losing sight of targets.

12. **Ranging and Observation of Fire.**—Recruits must be carefully trained in judging distance with the eye and finding ranges with the use of range finders. Although observation of fire is the best means of insuring that fire is effective, it will not be possible to use this method in peace training.

CHAPTER II

ATTACK AND DEFENCE

Section 6.—Some General Principles of Attack and Defence

1. **Need of General Principles.**—In no two military operations is the situation exactly the same. The character of the ground, the extent to which co-operation between the various arms is possible, the strength and morale of the opposing forces, their physical condition and the methods they adopt to gain their object must always differ. *It is impossible, therefore, to lay down a fixed and unvarying system of conducting any given military operation.* General principles and broad rules alone are applicable to the leading of troops in war.

2. **Determination to Conquer.**—Superior numbers on the battlefield are an undoubted advantage, but skill, better organization and training, and above all *a firmer determination in all ranks to conquer at any cost* are the chief factors of success. *Half-hearted measures never attain success in war, and lack of determination is the most fruitful source of defeat.* A commander who has once decided either to give or to accept battle must act with energy perseverance, and resolution.

3. **The Offensive Essential for Success.**—*Decisive success in battle can be gained only by a vigorous offensive.* Thus every commander must be determined to assume the offensive sooner or later.

4. **Value of the Initiative.**—*The power of initiative is essential for successful offensive action.* The defensive implies

loss for initiative, at least for a time, and is usually the consequence of inferiority of some description. Both opposing forces may endeavor to gain the initiative for offensive action, or one may await the attack of the other. In the latter case, if victory is to be won, the defensive attitude must be assumed only in order to await or create a favorable opportunity for decisive offensive action.

5. **Infantry Tactics.**—The essence of infantry tactics in the attack consists in breaking down the enemy's resistance by the weight and direction of its fire, and then completing his overthrow by assault—that is, *by bayonet charge.* Although the enemy may not await the assault, *infantry must always be animated with the desire to close with him as quickly as possible.* Troops under cover, unless enfiladed, can seldom be forced to retire by fire alone, and a decision by fire, even if possible, takes long to obtain. *To drive an enemy from the field, assault, or the immediate threat of it, is almost always necessary.*

6. **Surprise.**—Surprise forms so important a factor in all military operations that, notwithstanding the precautions taken to guard against it by the commander of the whole force, every subordinate commander is held responsible for the protection of his own command from surprise.

7. **Instant Action.**—Occasions will constantly arise in war when instant action is imperative. All commanders and bodies of troops must, therefore, when in the neighborhood of the enemy be prepared to assume responsibility and act instantly on their own initiative.

Section 7.—Infantry in Attack

1. **The Spirit of Attack.**—As already stated, decisive victories can only be won by vigorous attack. From the commencement of their training, therefore, instructors must inspire the men with the spirit of attack, and develop in them the habit of attack.

2. **Principle of Attack.**—*The main essential to success in battle is to close with the enemy, cost what it may.* A determined and steady advance lowers the fighting spirit of the enemy and lessens the accuracy of his fire. Hesitation and delay in the attack have the opposite effect. *The object of infantry in attack is, therefore, to get to close quarters as quickly as possible,* and the leading lines must not delay to advance by holding to fire until compelled by the enemy to do so.

3. **Stages of Attack—Object of each stage.**—An infantry attack in battle may roughly be divided into four stages. The object in each successive stage is as follows:

(i) **First.**—An advance to ground about 1,400 yards from the enemy's position from which rifle fire as a rule can first be brought to bear effectively on it.

(ii) **Second.**—A fire fight to gain superiority of fire and enable the advance to be pushed by degrees up to ground within close range as near as possible to the enemy's position from which the assault or bayonet charge can be delivered.

(iii) **Third.**—The final phase of the fire fight to gain that decisive superiority of fire which alone enables the assault to be made.

(iv) **Fourth.**—The *Assault,* to drive the enemy from the position at the point of the bayonet, and the *Pursuit,* to achieve a complete decisive success.

4. **First Stage.**—(i) **Formation.**—*As a general rule the formation to be adopted in battle will depend in every stage primarily on the ground and the tactical situation.* The advance during the first stage of attack is usually made in close order, generally in small columns of fours, with intervals between the columns, because as a rule that formation offers a more difficult target to artillery—especially as the heads of the columns are not evenly aligned—than a line in extended order, and also because during this stage it facilitates taking full advantage of cover affording concealment and protection and admits of efficient control. Examples of such formations are platoons or sections in fours or file.

(ii) **Method of Advance.**—Infantry coming suddenly under artillery fire will usually avoid loss more easily by advancing than by halting and making use of cover, *the position and range of which will probably be known to the enemy.* As a rule ground exposed to fire should be crossed quickly to minimize losses, and a rapid advance should be made with the same object during intervals in the enemy's fire. The pace, however, must be regulated carefully, so as not to tire men before the decisive stage of attack.

5. **Second Stage.**—(i) **Formation.**—As soon as the attacking force comes under the enemy's effective rifle fire—usually at about 1,400 yards distance from his position—it deploys into lines in extended order with fairly wide intervals between men with the object of minimizing losses. On open ground swept by effective rifle fire an extended line is the least vulnerable formation, and on such ground it will usually be advisable to extend *before* it becomes necessary for the advancing troops to open fire. *As a general principle deployment is necessary when fire is to be opened.* The amount of extension will then depend on the volume of fire which it is required to produce and upon the effect of the enemy's fire. The greater the extension of a line, the fewer will be the casualties, but the less will be its fire effect as there will be fewer rifles on a given frontage. *When the infantry struggle for superiority of fire has begun, casualties will be reduced, not so much by the formations in which troops are disposed, as by the material and moral effect of their fire and, still more, of the fire of the artillery, machine guns, and infantry who are covering the movement.*

(ii) **Method of Advance.**—At effective ranges, troops advancing steadily and rapidly suffer less than when they remain lying down, even under moderately good cover. This is due to the moral effect on the enemy and to the constant alteration of the range. During this stage the advance should be pushed as far as possible without opening fire to economize ammunition which may be difficult to replenish, and will be needed for the decisive fire fight. A formation in

small columns should also be retained as long as it is applicable to the situation, for when once extended, a unit loses its power of manœuvre.

Rushes.—When the advancing line is checked by a heavy and accurate fire, it will become necessary to continue the advance by rushes, which, according to the ground and the proximity of the enemy, will be made by the whole line simultaneously or by portions of it alternately. As a rule, in the seond stage, portions of the line will advance alternately in rushes to successive halting-places.

The length of rushes must depend upon the ground, the enemy's fire, and the physical condition of the troops. It is often advisable to make a rush of some length across open ground in order to reach good cover behind which men can rest. Similarly, if a firing line finds a long downward slope devoid of cover, it is often best to make one rush to the bottom of the slope. These forward movements are assisted by covering fire from artillery, machine guns and when possible from supports. They are also assisted by covering fire from neighboring portions of the firing line, a duty which is termed *mutual support.*

Halts.—Halts should not, under ordinary circumstances, be longer than the time necessary to attain superiority of fire, which will enable the advance to be continued. During the earlier phases of this stage when the enemy's fire may not have great effect, it should not be necessary to halt to reply to it so often as at shorter ranges when his fire will probably be more effective. The distance between halting-places may, therefore, be longer in early than in later stages of attack, and the advance from one to the other may be made in quick time so as not to tire men by unnecessary doubling.

Within 1,000 yards distance, as the firing line approaches nearer the enemy, and his fire becomes more effective, it may be necessary to minimize its effect by presenting as difficult a target as possible, and by replying more frequently to his fire in order to beat it down. Accordingly halts may be

made more frequently, the distance between halting-places may be short, and the advance will be carried out rapidly.

Reinforcements.—As the firing line approaches closer to the enemy, and to the ground from which the decisive fire fight in the third stage of attack will take place, it is gradually reinforced by supports and reserves. Thus the firing line becomes denser as it approaches the enemy—in other words, it contains more rifles on a given frontage, and the intervals between men are less than in the earlier stages of attack. Though the reinforced firing line for this reason presents a more vulnerable target to the enemy, its increased density enables it to deliver a heavier fire in the decisive fire fight for superiority of fire, and to make the assault in the greatest possible strength. *Reinforcements will carry extra rounds of ammunition to replenish the supply of the firing line.*

6. **Third Stage.**—At this stage the formation will usually consist of a dense line in which the men are practically shoulder to shoulder. As already stated, the ground from which the assault is to be made should be as close as possible to the enemy's position.

7. **Fourth Stage.**—(i) **The Assault.**—The assault should be delivered *suddenly by the whole attacking line simultaneously,* and pressed home with determination without a halt until the enemy is driven from his position. The bursts of artillery fire will have become frequent and intense at this period the object of the artillery being to demoralize the defenders and reduce their volume of fire.

(ii) **Rushes.**—In advancing by rushes *within close infantry range* the particular portions of the line to move first, and the strength of each such portion, will be determined partly by the ground and the enemy's fire, but chiefly *by the resolution and determination of the various leaders in the front line.* It must, therefore, be the principal aim of every leader in the front line to get his command forward. Rushes should be as strong as is reasonably possible. Creeping and advanc-

ing man by man check the rate of progress, and are to be regarded as exceptional methods, only to be employed when it is impossible to gain ground in any other way.

(iii) **Impulse for Assault.**—The fact that superiority of fire has been obtained will usually be first observed from the firing line. It will be known by the weakening of the enemy's fire, and perhaps by the movements of individuals or groups of men from the enemy's position towards the rear. The impulse for the assault must, therefore, often come from the firing line, and it is the duty of any commander in the firing line, who sees that the moment for the assault has arrived to carry it out, and for all other commanders to co-operate. On rarer occasions the commander of the attacking force may be in a position to decide that the time has come to force a decision, and may throw in reinforcements from the rear so that the firing line may gain the necessary impulse for the assault.

(iv) **Fixing Bayonets.**—Subordinate commanders in the firing line will decide when bayonets are to be fixed, in accordance with the local conditions of the combat and the nature of the ground.

(v) **Charge.**—The commander who decides to assault will order the charge to be sounded, the call will at once be taken up by all buglers, and all neighboring units will join in the charge as quickly as possible. During the delivery of the assault the men will cheer, bugles be sounded, and pipes played.

8. **The Pursuit.**—(i) If the assault is successful, and the enemy is driven from his position, immediate steps must be taken to get the attacking infantry in hand for the further work that lies before them. *The victory is as yet but half won, and the decisive success will be achieved only by the annihilation of the enemy.*. A portion of the troops must at once be pushed forward to harry the retreating forces while the remainder are being re-formed, under their own officers if possible, in preparation for a relentless pursuit.

(ii) Owing to the possibility of hostile gun fire being

brought to bear on the captured position, units should not be re-formed on the position itself, but should move forward to the least exposed localities available. The task of re-forming units will usually fall to subordinate leaders. *Steps must be taken to meet a possible counter-attack.* As soon as re-formed, units must be ready to carry on the pursuit by day and night without regard to their exhaustion. To sustain a relentless pursuit the utmost energies of every commander must be exerted. Only indomitable will can overcome fatigue and carry the men forward. A commander must demand the impossible and not think of sparing his men. Those who fall out must be left behind, and must no more stop the pursuit than casualties stopped the assault.

(iii) Infantry in pursuit should act with the greatest boldness and be prepared to accept risks. Delay for the purpose of detailed reconnaissance or for turning movements is not warranted, and the enemy must be attacked directly he is seen. *It must be remembered that as a general rule losses are always heavier when troops are retiring as compared with those suffered when advancing.*

9. **Entrenching.***—Infantry in attack must not delay the advance or diminish the volume of fire by entrenching. Entrenchments in the attack are only used when, owing to further advance being impossible, the efforts of the attacking force must temporarily be limited to holding the ground already won. The advance must be resumed at the first possible moment.

10. **Fortifying Tactical Points.**—During the advance, all important tactical points gained, such as suitable buildings, small woods etc., should, when required, at once be put in a state of defence, so that the enemy may not be able to recapture them and that they may serve as supporting points to the attack. Local reserves will often find opportunities for strengthening localities gained by the firing line, and to

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*Hasty fire cover and entrenchments suitable for protection in attack are described in *Field Entrenchments* of this series.

assist them in this work, detachments of engineer field companies may be attached to them with advantage.

11. **Reconnoitring the Line of Advance.**—As much as possible of the line of advance must be reconnoitred beforehand. In close country this will be carried out by officers or scouts. In open country it may be necessary to depend on observation through field glasses. It will usually be found, as a result of such reconnaissance, that certain lines of advance afford better concealment than others, while the localities offering the best facilities for covering fire will be brought to notice.

12. **Firing Line, Supports and Reserves.**—Infantry in attack will be divided into the *firing line,* a portion of which will usually be kept back to form *supports.* Behind these will follow *local reserves* in the hands of battalion, brigade, and divisional commanders. The relative strength of these bodies will depend on the ground, the information available, time conditions, and the possibility of effecting a surprise. *Each portion of the firing line will be given a definite objective or task, and it may also be advisable to fix the limits of its flanks.*

13. **Covering Fire.**—(i) When the ground permits, it is generally necessary to detail special detachments of infantry to provide covering fire for the leading troops. These detachments will usually be detailed from local reserves in the original distribution for the attack, but any commander, at any stage of the fight, may detail troops from those under his command to assist his advance. No fire-unit commander, however, is justified in abandoning, on his own initiative, an advancing *role* in order to become a detachment for covering fire.

(ii) In undulating or mountainous country it may be possible for these detachments to cover the advance from positions in rear, but in flat country it is impossible for infantry or machine guns to fire over the heads of their own troops, and opportunities for supplying covering fire must be sought on the flanks.

FIG. 1.—ADVANCE IN EXTENDED ORDER.

FIG. 2.—MOVING UP TO A HALTING PLACE.

FIG. 3.—FIRE AND MOVEMENT—MUTUAL SUPPORT.

FIG. 4.—FIRING FROM FOLD OF GROUND—UNNECESSARY EXPOSURE.

(iii) Troops detailed to give covering fire to others must take care to select as targets those bodies of the enemy whose fire is chiefly checking the advance. Great difficulty will often be experienced in detecting which these are, and all ranks must be on the alert to notice any indication of their presence.

(iv) As soon as their fire ceases to be effective in aiding the advance of the firing line, it is the duty of troops detailed to give covering fire *at once to join in the advance,* unless definite orders to the contrary have been received.

14. **Cover and Concealment from Air-craft.**—(i) Cover from hostile air-craft can best be obtained by moving through woods or along hedgerows. The difficulties of observation from the air are increased if men stand still or lie down when a hostile air-craft approaches, and *refrain from looking up* when it passes overhead. *When once committed to the attack no attempt will be made by the firing line and supports to seek cover from the enemy's air-craft, the mission of which at this time will more probably be to locate the reserves.*

(ii) Even a few troops marching on a wide road are clearly visible from the air. In order to conceal a movement from hostile air-craft troops should keep to the sides of the road, and march on grass rather than the metalled portion. Narrow roads with high hedges are the most favorable for concealment.

Section 8.—Training the Company in Attack

1. To begin an exercise the company commander should assemble the company in a position which should, if possible, afford cover from the enemy's view. The distance of the objective must depend upon circumstances, and the extent of the ground available for training. It should, if possible, be about a mile distant from the place of assembly.

2. **Company Scouts.**—(i) If considered desirable, a few scouts may precede the firing line before fire is opened, to

feel the way for the advance. They should be sufficiently far in advance of the firing line and of the exposed flank of the company to obviate surprise and to obtain timely information as to the ground which the company is to cross. In close or undulating country connecting files may be necessary to maintain touch with the scouts, but they should be recalled as soon as connection can be maintained without them. Scouts preceding the firing line will, when checked. remain in observation until the firing line comes up to them, when they will rejoin their companies. Scouts on the flanks will remain in observation and keep connection with other units in the flanks until recalled.

(ii) Scouts must be given ample time for their task, for, unless unforeseen circumstances arise, the attack will not be launched until their return and submit their report. They should work in pairs, as one will then be available if necessary for carrying back news, while the other continues his reconnaissance. They must be told all that is known of the enemy, the direction in which they are to move, and how and where they are to communicate with the company commander.

(iii) Men acting as scouts in field exercises must not approach closer than 500 or 600 yards from the enemy's position, as in war it would seldom be possible for them to get nearer in daylight. They must make use of all available cover in order to conceal their movements. Should they expose themselves needlessly, or approach too close to the enemy's position, instructors must not allow them to take further part in the exercise, or to communicate to their commander any information they may have obtained.

3. **Duties of Company Commander.**—(i) The orders which the company commander will issue before advancing to the attack will be based primarily on those received from his battalion commander, and secondly on the reports of scouts, on his personal reconnaissance of the ground, and his knowledge of the situation. He should make full use of his horse during the preliminary stages, to reconnoitre ground

and to keep in touch with his battalion commander and adjacent companies. Throughout the action the company commander will maintain communication with his platoon comcanders, with the battalion commander, and with the companies on his flanks. He will as a rule accompany the final reinforcement of his company into the firing line.

(ii) Supports.—The company commander should, as a rule, divide the company into firing line and supports, and, if the company is operating alone, a reserve should be kept in hand as long as circumstances permit.

(iii) **Orders to Platoon Commanders.**—In formulating his orders the company commander should indicate generally the task, objective, and direction of each platoon. If more than one platoon is detailed for the initial firing line, he should allot a definite objective to each. He must arrange for the replenishment of ammunition, and decide on the position of the ammunition animals during the advance. He should inform his officers of the place to which reports are to be sent, and of his own position during the earlier stages of the operation.

(iv) **Example of Order for Attack.**—*"The enemy are holding that ridge over there. Our battalion is ordered to attack the enemy from that single fir tree half left to these three haystacks half right. Our company will be in the firing line and will attack from that single fir tree half left to those bushes on the ridge* 100 *yards to the right of the fir tree."*

4. **Duties of Platoon Commanders.**—(i) As soon as he has received his orders the platoon commander should explain the situation to his subordinates and point out the line of advance. *He must insure that the movements of his platoon do not mask the fire of units on his flanks,* and must endeavor *to co-operate with neighboring units* throughout the attack. He must direct the fire of his platoon as long as it is possible for him to do so, regulate the expenditure of ammunition, and take steps to secure a further supply when required.

(ii) He must watch the enemy's movements, and report

at once to the company commander and to neighboring units if anything of importance is observed. He must also be on the look-out for signals from his company commander, and should detail an observer to assist him in this duty. During the advance he must take every opportunity of rallying his command on suitable ground. When the whole platoon is advancing by rushes, *he must select and point out successive halting-places,* and must himself lead the rush. After a successful assault, he must get the men in his vicinity under control as quickly as possible in preparation for an immediate pursuit.

5. **Duties of Section Commanders.**—The duty of the section commander is to lead his section. He must see *that the direction is maintained, and that he does not mask the fire of neighboring sections.* When the advance is being made by sections, *he must select and point out the successive halting-places of his section and must regulate the number of men to occupy particular portions of cover.* He must control and when necessary direct the fire of his section, and, as reinforcements come up into the firing line must take all leaderless men in his neighborhood under his command, giving them the range and indicating targets. He must pass on quickly all reports that come to him, and inform his platoon commander of any hostile movements which he may observe.

6. **Mutual Support.**—The various portions of the firing line will also on occasions be able to afford each other mutual support by fire, and all commanders must be on the alert to assist units on their flanks in this manner when the situation requires. Mutual support in the firing line will, as a rule, however, be more automatic than deliberately arranged, and in no case must its employment be allowed to induce hesitation in the advance. The paramount duty of all leaders in the firing line is to get their troops forward, and if every leader is imbued with a determination to close with the enemy he will be unconsciously assisting his neighbor also, for, as a rule, *the best method of supporting a neighboring unit is to advance.* Covering fire in mutual support should consist

of heavy bursts of rapid fire, sustained during the forward movement, and directed at the enemy to the front of the advancing unit, as well as to the front of the unit firing.

7. **Reinforcements.**—(i) *The distance between the firing line and supports* will be determined by the company commanders, or the officers commanding each portion of the supports, according to the ground; they will seldom be the same in every company, and may vary during the course of an advance. If the ground is favorable supports should close up to the firing line under cover; on open ground the distance between them should be such that the supports will not suffer heavy losses from fire directed at the leading line.

(ii) The aim of officers commanding supports must be so to handle their commands as to be able to reinforce the firing line with as little delay as possible when required. Care must be taken not to dissipate energy by reinforcing in driblets. *Reinforcement should usually be by bodies not smaller than platoons.* In the later stages of an attack it is essential that reinforcing lines should carry up extra ammunition for the men in front.

8. **General Instructions.**—(i) *Combined action* is always more likely to be successful than isolated effort, and so long as control is possible the individual man must watch his leader and do his best to carry out his intentions. When, however, the section is under heavy fire, section commanders cannot always exercise direct control, and in these circumstances men should endeavor to work in pairs, estimating the range for themselves, firing steadily, and husbanding their ammunition.

(ii) If incapacitated from advancing, the soldier's first duty is to place his ammunition in a conspicuous place, ready to be picked up by any other men, and all ranks must seize opportunities that offer for replenishing their ammunition in this manner. If, when reinforcing the firing line, or at any other time, a soldier loses touch with his section commander, it is his duty to place himself under the orders of the nearest

officer or non-commissioned officer, irrespective of the company or battalion to which he may belong.

Section 9.—Halting-Places in Attack

1. **Paramount Consideration.**—The paramount consideration in choosing halting-places is *that men should be able to use their rifles as effectively as possible*—that is, that they should have a clear view up to the enemy's position and be able to fire freely. If in addition to these essential conditions ground can be found with cover, which affords protection from fire, or concealment from view without drawbacks, it will be an advantage. *All other considerations, however, must always be subordinated to the paramount consideration of striking power.*

2. **General Rules.**—The following general rules regarding halting-places in attack must be applied with intelligence to a variety of conditions in the field. *It may not always be possible to find good halting-places or to avoid bad halting-places and dangerous cover.* The choice may often lie between alternative disadvantages. *Again it may be less disadvantageous to occupy a bad halting-place affording cover of any kind than to remain in the open.* Instructors must impress these facts upon the minds of recruits and train them *to make the best use of ground under the conditions of each tactical situation.*

(i) **A Good Halting-place** will combine the first two conditions set out in this paragraph, and perhaps afford either concealment or protection from fire. Such positions are shown in Figs. 5 and 6. The ideal position, which, however, will rarely be found, combines the following advantages:

(*a*) Affords a clear view up to the enemy's position.

(*b*) Permits the free use of the rifle.

(*c*) Gives concealment to the firer.

(*d*) Provides protection for him against the enemy's fire without hindering further advance.

(ii) **A Bad Halting-place** is one which involves any of the following serious disadvantages:

(*a*) Offers a well-defined target for the enemy's fire, and provides no protection from its effects.

(*b*) Gives a restricted view of the enemy's position.

(*c*) Restricts the free use of the rifle.

(*d*) Obstructs the advance of troops occupying it in attack.

(iii) **Dangerous Halting-places.**—*Features of ground which offer clearly defined targets for the enemy's fire, and afford no protection from its effects, are dangerous for halting-places if occupied in view of the enemy, especially if they run parallel to his position.* Common examples of such features are an isolated hedge or the edge of a wood.

(iv) **Dangerous Cover.**—*Isolated bushes or occasional patches of undergrowth which do not afford protection from fire are dangerous if occupied in view of the enemy, because they offer clearly defined targets, and the concealment from view which they afford is valueless if the enemy knows they are occupied.* As a rule such cover should be avoided even if it affords protection from fire, as in the case of occasional rocks or small mounds of earth, especially at closer ranges because men, if seen occupying such cover, can easily be *marked down* by the enemy and hit on leaving it. Rocks may also be dangerous owing to the risk of injury from splinters.

(v) **Hedges.**—This form of cover by *itself*, in addition to the disadvantages mentioned, may also obstruct the advance of troops, and for this reason may be the cause of heavy casualties when they attempt to leave it. A hedge growing on a bank or on the side of a ditch affords protection, and may under certain conditions be a good position for a halting-place despite its disadvantages.

(vi) **Banks and Walls.**—These forms of cover, though providing protection from fire, usually have the disadvantage of offering a well-defined target for the enemy's fire. A stone wall in addition may involve the risk of injury through splinters if subject to artillery fire, and, if at all high, may

obstruct the advance of troops occupying it, and result in heavy casualties when they leave it to move forward. A well-led enemy will reserve his heaviest fire for the forward movement from both these forms of cover directly it commences.

(vii) **Ridges and Folds of Ground** (Figs 5 and 6).—These features commonly provide good halting-places. The latter may be difficult to recognize from a distance. If properly used they may afford both concealment to a great extent as well as protection from the enemy's fire, for which as a rule they do not offer well-defined targets.

(viii) **Bushes and Undergrowth.**—This cover affords concealment from view, and though it does not afford protection from fire it may, if not entered in view of the enemy, provide good halting-places if it does not obstruct or restrict a clear view of the enemy's position, and if it does not grow in isolated or occasional patches, but covers the ground sufficiently not to offer a well-defined target for the enemy's fire, as in the case of the ground shown on Fig. 1.

(ix) **Sky-Line** (Fig. 1).—Halting-places which give a sky-line from surrounding ground should be avoided if possible as offering a good target for the enemy's fire. Such positions—as, for instance, on the crest of high ground—are more dangerous in defence than in attack, because they are occupied for a length of time instead of temporarily.

(x) **Knolls and Small Hollows.**—These features often provide halting-places which are good in themselves, but experience shows that they tend to cause men to crowd into them together to their danger, unless steps are taken to prevent this by section commanders. Features such as pits and quarries may also obstruct the advance, owing to the difficulty of climbing out.

(xi) **Buildings and Enclosed Spaces.**—Buildings and enclosed spaces such as farm-yards may prove useful as halting-places in attack if they do not provide well-defined targets for the enemy's fire and do not unduly obstruct the advance

of troops occupying them. They can be turned into excellent *defensive positions.*

(xii) **Diagonal and Irregular Features.**—Features such as a bank or hedge, which do not run parallel to the line of advance, however good for halting-places, may lead to the loss of direction, and perhaps involve the risk of being enfiladed by the enemy's fire, unless care is taken to prevent this by platoon and section commanders. Positions of irregular shape, such as a ridge which curves or zigzags appreciably, may also lead to the loss of direction in the absence of careful leadership, because men will instinctively tend to adapt themselves to the line of cover.

(xiii) **Alternative Halting-places.**—When two equally good halting-places lie fairly close to one another, as a rule, and unless the reverse is advisable for special reasons, the farther place should be occupied, so as to save time and push the attack forward as far as possible.

(xiv) **Halting-places in the Open.**—It may sometimes be necessary to occupy such halting-places in the open. Even in the absence of cover, positions in the open may afford concealment to some extent, because men in the open, in dry grass, or on ground which harmonizes with the color of their uniforms, are often exceedingly difficult to see.* *It must however, be remembered that an object which escapes observation while stationary may be seen if it moves.* Accordingly all unnecessary movements must be avoided when halted in the open.

3. **Instruction of Recruits.**—(i) To simplify instruction and render progression more gradual the training of recruit unit commanders may first be confined to the choice of halting-places in attack by personal reconnaissance, and to practising their commands in occupying selected places. Their training in leading their units over ground by correct methods in right formations, and with the proper use of ground and

* See Fig. 7, where a whole company lying out in the open at close range to the right is difficult to see. The same remark applies to the group of men lying prone to the left of Fig. 2.

cover may, at the discretion of instructors, be reserved for a later stage of training.

(ii) To begin with, the instructor will define a tactical situation, discuss the problems of ground which it involves, and indicate the best halting-places. The unit will then be ordered to occupy the positions selected, and its work will be criticised by the instructor. When sufficient progress has been made by this method of training, the instructor will indicate the position and approximate distance of the enemy, and the line of advance to be followed. Without previous explanation or direction from the instructor, unit commanders will then reconnoitre the ground along the line of advance to select halting-places. There should be a short time-limit for the reconnaissance for each position.

(iii) **Criticism.**—When a halting-place is selected, recruits will move up to it, and unit commanders will order their commands to occupy it. The instructor will then point out the merits and disadvantages of the position selected with regard to the points in para. 2 of this section and indicate better positions, if any. He must be careful to rectify faults such as regard to loss of direction, wrong formations, and unnecessary exposure (Fig. 4).

4. **Obstacles to the Advance.**—Obstacles, other than those constructed by the enemy to strengthen a defensive position, which troops may commonly encounter in France, are walls, hedges, wire and other fences, and small streams. Recruits may be trained to pass obstacles according to the following general rules when they can properly be applied:

(i) To select a good halting-place as near the obstacle as possible and deliver a heavy fire to gain temporary superiority.

(ii) To rush the obstacle under heavy covering fire, either with the whole line simultaneously or by alternate portions in a suitable formation according to the nature of the obstacle.

(iii) If the obstacle is passed by alternate portions of the line, those first should push forward to a halting-place some

distance from the obstacle if it offers a good target to the enemy's fire, and assist succeeding portions of the line to pass the obstacle by covering fire.

Section 10.—Infantry in Defence *

1. **Defensive Tactics.**—Defensive tactics in which infantry are employed differ according to the object in view. In *Active Defence* the ultimate object is to create and seize a favorable opportunity for a decisive offensive. In *Passive Defense* the object is to beat off an attack without hope of being able to turn the tables on the enemy by assuming the offensive at some stage of the fight, as, for example, in the defence of a fortified post weakly garrisoned. Defensive tactics include the *Delaying Action,* the object of which is to gain time by means of manœuvre without risking defeat, such as the work of rearguards, or when awaiting the arrival of reinforcements. In this book instruction in defence is confined to elementary training in the duties of Active Defence.

2. **Advantages of Defence.**—The following are the chief advantages of defence:

(*a*) Opportunity is afforded for selecting a good fire position.

(*b*) If time permits, the position can be so strengthened by clearing the field of fire, by providing cover, and by constructing obstacles to impede the enemy's advance, as to allow of the troops in the firing line and supports being reduced to a minimum, thus adding to the strength of the force kept in hand for counter-attack.

(*c*) The ranges of prominent objects can be taken, and fire effect thus increased.

(*d*) Arrangements can usually be made for supports to reinforce the firing line without exposing themselves to fire.

(*e*) The problem of ammunition supply is simplified.

* For the defence of close country, woods, villages, and buildings, see Chapter VI of this book and *Field Entrenchments* of this series.

(*f*) Troops on the defence are far more difficult to locate than are those advancing to the attack.

Against the above advantages, however, must be weighed the fact that the defenders cannot hope to obtain decisive results unless they are able ultimately to turn defence into offence. *No natural or artificial strength of position will of itself compensate for loss of initiative when an enemy has time and liberty to manoeuvre. The choice of a position and its preparation must therefore be made with a view to economizing the power expended on defence in order that the power of offence may be increased.*

3. **Choice of Positions for Active Defence.**—*In active defence the position is held only as a means of creating a favorable opportunity for eventual offensive, and therefore it is essential that the position should be chosen with a view to facilities for launching the attack. Unless there be favorable ground for this, the position cannot be considered a suitable one for the object in view.* In war a defensive position usually consists of a series of defended localities with intervals between them.

4. **Strengthening Defensive Positions.**—(i) Defensive positions will usually include a number of localities of special tactical importance. The efforts of the defender will be directed in the first instance to occupying and securing these points, so that they may form pivots upon which to hinge the defence of the remainder of the position. The defences of these localities should be arranged so that they may give each other mutual support and should always be allotted to a definite unit.

(ii) If these points are naturally strong or can be made so artificially, and if they are adequately garrisoned, so as to form a framework against which the enemy must expend his strength, the intervening ground need not be held in a continuous line. The object should rather be to utilize this intervening ground for local counter-attacks, while arranging for either direct or flanking fire, or both, to be brought to bear on all ground over which the enemy may advance. A

FIG. 5.—FIRING FROM FOLD OF GROUND—ENEMY'S POINT OF VIEW.

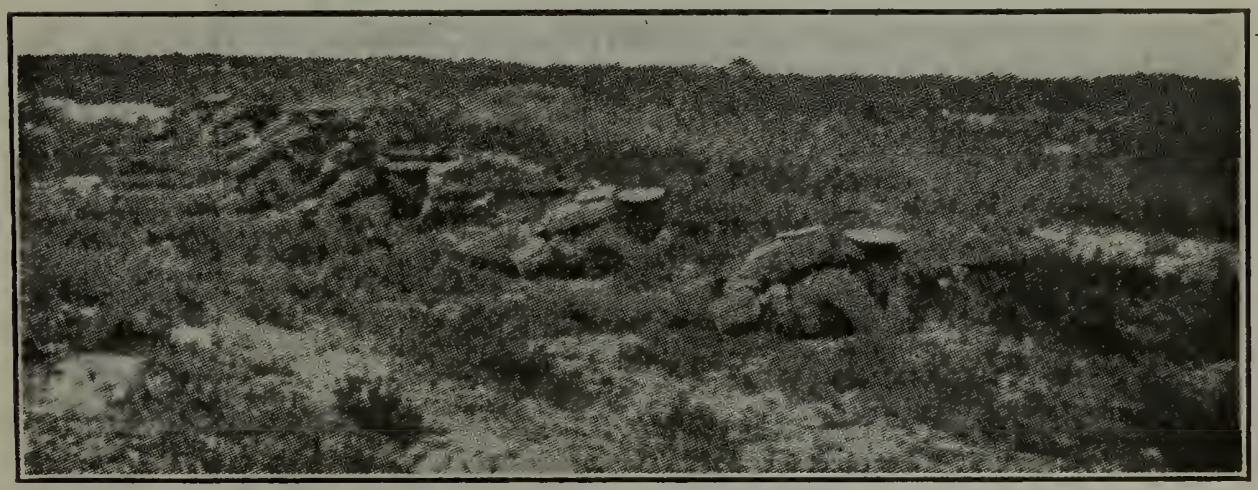


FIG. 6.—AS ABOVE—SIDE VIEW.

FIG. 7.—DEFENSIVE POSITION—COMPANY READY TO MAN TRENCH

defensive position prepared in this manner lends itself to local counter-attacks, which keep alive an offensive spirit in the defenders, exhaust the enemy's powers, draw in his reserves, and thus prepare the way for the assumption of the offensive.

(iii) The methods of preparing and entrenching localities and the various types of trenches are described in *Field Entrenchments* of this series. The preliminary measures should be based upon as thorough a reconnaissance as is possible by each commander of the area for which he is responsible.

5. **Distribution of the Defending Force.**—The troops will be divided into two main portions, one, known as the general reserve, to be held in readiness for the initiation of a general offensive when a favorable opportunity has been created, the other to create the desired opportunity by temporarily taking up a defensive position, and then to co-operate actively with the general reserve in its attack on the enemy.

Section 11.—Elementary Training in Active Defence *

1. **Scope of Recruit Training.**—(i) As already explained recruit training, especially in defence, must by its nature be extremely limited in scope, and is here confined to active defence. The ground available for the choice of positions will probably be very restricted. It may not be possible, owing to the want of equipment and facilities, to strengthen positions. The removal of obstacles to improve the field of fire and their construction to impede the enemy's advance are duties beyond the scope of training, while the effect of artillery fire in assisting the defence can only be considered very generally indeed, and had perhaps better be eliminated altogether with the object of simplifying instruction.

(ii) The enemy, moreover, may be confined to frontal attack, and the direction of his advance and his objective

* See *Field Entrenchments* of this series.

will always be known, whereas in war he would be free to vary his plan of attack on the position as he pleased. Finally, problems connected with the protection of flank and retirement in case of defeat should not be considered to avoid complicating instruction. For these among other reasons training in active defence should be confined to *very simple, elementary exercises* in the application of general principles under the following heads:

(*a*) Choice and occupation of defensive positions.

(*b*) Taking the ranges of prominent object in the field of fire.

(*c*) The fire-fight.

(*d*) The local counter-attack.

(iii) **Construction of Cover and Obstacles.**—As already stated, the strengthening of defensive positions, except perhaps in the simplest and most elementary forms, is beyond the scope of recruit training. Different simple forms of hasty fire cover, the digging of pits and trenches, and the concealment of defensive works are all considered in *Field Entrenchments* of this series, and the more elementary works described may be suitable and practicable for recruit training.

(iv) **Improvised Cover.**—When it is not possible to construct cover it may be possible to improvise it by the use of sand-bags, or even to indicate the line of cover by pegging a length of tape to the ground or by some other cheap and simple means.

(v) **Distribution of Units.**—As a rule it will only be possible to train units in the defence of a portion or whole of a single locality, other localities on either side being indicated as continuing the defensive position.

(vi) **Factor of Time.**—In training it is usually best to assume that *there is no time to do more than choose the best natural position for defence under the circumstances, occupy it and take the ranges of objects in the field of fire before the attack commences.* When facilities are available for constructing simple forms of cover, this branch of instruction may be included in an exercise.

(vii) **Choice of Positions.**—For the purpose of training positions must be chosen in the light of a few easily understood general rules, and the following are suggested for the guidance of instructors:

(*a*) Provide a clear field of fire up to at least 600 yards, and if possible over a greater distance.
(*b*) Provide cover which gives protection from the enemy's fire without offering him a well-defined aiming mark.
(*c*) Not be commanded on either flank by ground from which the position can be enfiladed.

In practice a perfectly good position will rarely be found. *Recruits must, therefore, be trained to strike an average between the advantages and disadvantages which every position must offer, and to select positions affording a good field of fire with protection if possible.* Protection, of course, may be improvised or constructed as suggested in paras. (iii) and (iv), this section.

The information concerning various types of cover contained in this section applies in a general sense also to positions and cover for defence. *As a rule positions which offer a well-defined target for the enemy's fire, and more especially to his artillery, for which a defensive position presents a stationary target, are disadvantageous.* It must be remembered, however, that in war, when there is time to prepare a position for defence, cover, such as the line of a trench which offers a well-defined target to the enemy, will be *concealed or rendered difficult to see* in various ways, such as by screening or backing it with bushes and foliage, and also that *the field of fire will be cleared.*

2. **Ground in Relation to Fire.**—(i) A part from its natural and other features which may obstruct view, afford protection and otherwise restrict the field of fire, *the conformation of ground and the manner in which it lies with respect to a defensive position both affect the field of fire according to their relation to the tragectory of the bullet.* The choice of a position, therefore, necessitates a careful

study of ground in its relation to fire, despite the fact that the field of fire can be cleared.

(ii) This subject is fully considered in the *Musketry Manual* of this series. It will be explained to the men both in the lectures and in the musketry course which will precede training in the field. In training the company in defence for the purpose of simplifying instruction, and in view of the fact that exercises will usually be carried out at fairly short ranges, the consideration of this problem may be limited, at the discretion of instructors, to the problem of *dead ground.* Every opportunity, however, should be taken of studying the ground generally in its relation to fire when choosing defensive positions.

(iii) **Dead Ground.**—Dead ground is ground on which, owing to its conformation or to the existence of natural or artificial cover, fire cannot be brought to bear from a given locality. The term is thus a relative one; for though an area of ground may be dead in relation to one locality it may be possible to bring fire to bear upon it from another locality, in relation to which it will not therefore be dead. As already explained, dead ground favors the attack, and is a serious disadvantage from the point of view of the defence, for which reason it must be taken into consideration, and avoided if possible in choosing defensive positions. Dead ground may sometimes be brought wholly or to some extent under fire, according to circumstances, by moving if possible to either flank, by moving forward or retiring, and by moving on to higher or lower ground provided suitable positions are then available. For example, a position at the crest of a hill with a convex slope, will give dead ground at the foot of it, whereas a position some distance down the slope or at the foot of it may command the whole ground to the front.

3. **Extent of Frontage.**—(i) When men have been trained in selecting defensive positions they will be practised in occupying them. This work will necessitate the consideration of questions regarding the frontage to be occupied by the firing line and the position to be taken

up by the supports. These questions may be decided according to a few broad general principles which are applicable to different situations.

(ii) The firing line need not occupy a continuous position, but care must be taken that the whole ground in front of the position is brought under fire. In deciding the frontage to be occupied by the firing line it is necessary to remember that room will be required for the supports when they are brought up to reinforce it.

(iii) The extent of frontage needs careful consideration. In war, too extensive a position militates against economy of power by making it necessary to employ a large force for the firing line and supports at the cost of the reserves, which may, therefore, be so weakened as to render them incapable of carrying out satisfactorily their offensive mission in counter-attacks. On the other hand, too restricted a front may enable the enemy to develop early in the engagement strong flank attacks, which may make the position untenable before the time is ripe for a decisive counter-attack.

4. **Flanks of Position.**—(i) Although the training of men may be limited to frontal attacks, and therefore problems regarding the flanks of defensive positions may not come within the scope of their instruction, it will be necessary to bear in mind certain principles connected with flanks, not only in connection with the choice of positions, but also with regard to the frontage of a position. *The flanks are always the weakest part of a position if they are open to attack, and an extension of front which under other conditions would be excessive may be wise if it enables one or both flanks to be posted strongly.*

(ii) If the flanks can be rendered sufficiently strong, the enemy will be forced to attempt to drive his assault home against the front of the position. The flanks are therefore an important consideration in choosing a position for defence, and both flanks should always be made as strong as possible. It is a great advantage if one flank at least can be posted so strongly that the enemy is compelled to make his

main efforts against the other, as this will usually enable the defence to foresee the probable direction of the enemy's decisive attack, and to make dispositions accordingly.

5. **Position of Supports.**—The troops allotted to the defence of each section of the position will be divided, as in attack, into (i) firing line, and if necessary supports, and (ii) local reserves. These directions will also apply to the officer responsible for the defence of a whole position when it is not divided into sections.

(ii) **Cover.**—Cover to protect the supports from loss during the fire fight is essential and must in war be constructed in the position they occupy if natural cover is not available. With a view to minimizing losses the position for supports should be chosen if possible so that they can be moved up under cover of folds of the ground or its natural features to the position they will have to occupy in the firing line, which should be indicated clearly to section commanders by the company commander, and pointed out by them to the men. In war, cover is constructed when necessary and possible to protect supports in moving up to the firing line.

6. **Taking Ranges.**—(i) In preparing positions for defence there is usually time for studying the ground over which the attack must advance, and for taking the ranges of various prominent objects which the enemy must pass in his forward movement. *A knowledge of the exact range of the enemy's line at any spot in different stages of the attack will enable the defence to use its fire with the greatest possible effect in various phases of the attack and perhaps to create a favorable opportunity for the counter-attack.* Men should be trained to take ranges according to the directions laid down in the *Musketry Manual* of this series by the use of range finders. If necessary the distances may be paced (see also *Field Entrenchments.*).

(ii) **Selection of Range Marks.**—Range marks should be chosen after a careful and intelligent study of the ground based upon knowledge of infantry tactics in attack. The reason for selecting each range mark must be explained

to the men, and they must be practised in using their judgment in selecting these marks for themselves. Examples of good range marks are well-defined targets such as hedges, especially if they run parallel to the defensive position, good fire positions likely to be occupied by the enemy, and obstacles such as fences which he must surmount, and which are likely to impede his advance.

(iii) **List of Range Marks.**—A list of selected range marks with their ranges will be prepared by section commanders and given to the men in the form of a range card. In this list range marks should be described as far as possible in the terms which will be used for describing them as targets in fire orders. If there is time section commanders should make sure that the men recognize each range mark described in the list when indicated on the ground, and know its correct range without referring to the list.

(iv) **Improvised Range Marks.**—If features of the ground which will serve as range marks are lacking on the training ground, instructors may improvise range marks by placing small heaps of stones, wisps of straw or pieces of paper attached to sticks in various places, where they are visible from the defensive position. These measures may be used to introduce variety into training when the natural range marks available are limited and have already been used frequently for instruction.

7. **Exercises in Defense.**—When recruits have been instructed in the choice, occupation, and preparation of a defensive position, the company will be exercised in defence. Each exercise, as in practices in attack, must be based on a tactical situation, and should include the orders of the battalion commander. These orders will apportion a selected portion of the defensive position to be held by each unit. The direction from which the enemy will advance will be indicated.

8. **Scouts and Intercommunication.**—While the units are taking up their allotted positions, scouts will be sent out to watch for the enemy and give warning of his ap-

proach, arrangements having been made previously for communication by signals or messages between the scouts, the firing line, the supports, and the commander's position. Scouts may work in pairs as in attack.

9. **The Attacking Force.**—As many men as are available should be made to represent the attack. They should wear distinguishing marks such as a white band round their caps or arms. They should manœuvre towards the position from at least 800 to 1,000 yards distance if possible, taking care to carry out the advance in every respect according to the directions laid down for the attack. This should be done even when the attack is carried out by a skeleton force.

10. **Duty of Firing Line and Supports.**—The duty of the firing line is to prevent the enemy from advancing on to the position, by the employment of fire controlled by leaders, through which the firing line will attempt to exhaust the enemy by an obstinate and determined defence of the ground allotted to it, thus preparing for the ultimate offensive. The duty of the supports is to replace casualties in the firing line and infuse fresh vigor into the defence.

11. **Duties of Commanders.**—The duties of a company commander in defence are generally similar to his duties in attack. He must, however, also arrange for the occupation and preparation of the ground allotted to him for defence to the best advantage. Platoon and section commanders, in addition to the general duties already described, must see:

(i) That every man can use his rifle effectively.

(ii) That the cover is adequate.

(iii) That the entrenchments constructed are concealed from the enemy.

(iv) That ranges are taken and communicated to troops.

(v) That the supply of ammunition and water is ample.

12. **The Counter-Attack.**—A commander who decides upon an active defence changes from the defensive to the offensive by lauching his general reserve. To avoid confusion this general or decisive counter-attack is termed the

Assumption of the Offensive. The assumption of the offensive should not be confined to the advance of the general reserve alone. Commanders of sections of the defence who are permitted by the local situation to do so must at once join actively in the attack unless otherwise ordered. Training in this book is confined to a local counter-attack. A *local counter-attack* may be delivered on the initiative of any commander who keeps local reserves in his hands or by commanders of sections of the defence with the reserves of sections with the object of driving back the attack and compelling the enemy to use up his reserve to restore the battle, or when the enemy has succeeded in penetrating the position at any point. Favorable opportunities for counter-attack will occur when the enemy's line comes within reach at close range without sufficient support, and when fire superiority over him has been gained temporarily.

13. **Training in Local Counter-Attack.**—(i) If a counter-attack is included in the scheme of an exercise, provision must be made for reserves as well as supports. The counter-attack may be delivered either on the order of the company commander or at some arbitrary moment, as may be considered advisable. Exercises in local counter-attack should be limited to a rapid advance against that portion of the enemy's line selected.

(ii) **Method of Advance.**—The opportunity for counter-attack will probably be fleeting, and there may be little time for giving detailed orders, but when possible the direction and manner of carrying it out should be indicated to subordinate commanders and explained by them to the men. This should be done as an invariable rule in the earlier stages of instruction, and until the men are sufficiently advanced to carry out an exercise satisfactorily without preliminary directions. In war the reserves are located under cover in rear of the defensive position. The counter-attack is usually delivered through the interval between two defended localities. The advance will be carried out at the double, assisted by heavy covering fire.

CHAPTER III

INFANTRY OUTPOSTS

Section 12.—General Information

1. **Outposts.**—(i) Outposts are troops detached from the main body of a force in war when it is halted, to protect it against surprise attacks by day or night. They usually consist of infantry working in co-operation with cavalry or cyclists. The mounted troops will be responsible for the duties of observation at a distance from the outpost line: the infantry for resistance and for their own immediate protection against surprise.

(ii) The outpost infantry will be divided into pickets and supports, the former to furnish sentry groups and to hold *the outpost line of resistance,* the latter to reinforce the pickets when required. Outpost infantry may also be required to furnish patrols, and on occasions a portion of it may be held back to form an outpost reserve. Outpost companies provide pickets detached posts, and supports as required. The work of outposts is both exacting and exhausting, and as few men as possible, compatible with the safety of the force they protect, should be employed on it.

2. **Duties of Outposts.**—(i) The duty of outposts is to give warning of any threatened attack, and in the event of attack to gain time, at any sacrifice, for the commander of the force protected to put his plan of action into execution. A force can only be regarded as secure from surprise when every body of the enemy within striking distance is so closely watched that it can make no movement without

its immediately becoming known to the outposts. The first duty of outposts, therefore, is *observation* of the enemy, the second duty *resistance*.

(ii) **Observation of the Enemy** will consist of:

(*a*) Keeping such a close watch on all bodies of the enemy within reach of the outposts that no movement can be made unobserved.

(*b*) Watching all approaches along which an enemy might advance.

(*c*) Examining all neighboring localities in which his patrols might be concealed, or which he might occupy preparatory to an attack.

(iii) **Resistance.**—Resistance will consist of delaying the enemy on a prepared defensive line, called the outpost line of resistance, until further orders are received from the commander of the protected force.

(iv) The duty of observation must never be relaxed, whatever the distance of the enemy, but the number of troops detailed for resistance will depend on the ground, the distance of the enemy, and the tactical situation.

(v) When there is any chance of a force coming in conflict with the enemy, the commander, when halting, should first decide on his plan and dispositions in case of attack, and then arrange the quartering of his command and the general position of the outposts accordingly.

(vi) **Secrecy.**—The duty of outposts is to observe without being seen. Troops employed on this duty must be concealed carefully. No compliments will be paid on outposts. Precautions must be taken not to betray the position of troops by the movements of men on duty or otherwise through lights, smoke of fires, or in any other way.

3. **Distance from the Troops Protected.**—The distance of the outpost position at the line of resistance from the troops protected is regulated by the time which the latter will require to prepare for action, and by the importance of preventing the enemy's artillery from approaching within effective artillery range of the ground on which these troops

will deploy if attacked. On the other hand, especially in the case of small forces, the distance must not be such as would permit of the outposts being cut off, or as would necessitate the employment of an undue proportion of men on outpost duty.

4. **Disposition of Outposts.**—(i) In the case of a force spread over a considerable frontage, or one distributed in depth, the commander will usually divide the outpost line decided on into sections, delegating responsibility for the holding of each section to the commander of a subordinate unit of formation, and defining the limits of sections by distinctive features, such as trees, cottages, or streams. A road is not a suitable boundary for a section.

(ii) Each subordinate commander concerned will then detail the necessary troops for his own portion of the outpost line and will appoint an officer to command them. This officer will be designated the *outpost commander.* He will also be responsible that his outpost arrangements are coordinated with those of the sections on his flanks. In the case of a small force the commander will usually himself detail the whole of the outpost troops and appoint an officer called the outpost commander to command them.

5. **Duties of an Outpost Commander.**—(i) An outpost commander should be given information on the following points.

(*a*) What is known of the enemy and of other bodies of our own troops.
(*b*) Intentions of the commander who appoints him, if the enemy attacks.
(*c*) Where the force to be covered will halt.
(*d*) The general position to be occupied by the outpost troops under his command and, if there are other troops on his flanks, the limits of the line for which he is responsible.
(*e*) Detail of the troops allotted to him.
(*f*) Hour at which they will be relieved.
(*g*) Where reports are to be sent.

(ii) After receiving the above information he will give such orders as are immediately necessary for protection against surprise. He will then allot tasks to his mounted troops, and will decide on a line of resistance for the outpost infantry, dividing the frontage among the outpost companies at his disposal. When there are other outpost troops on his flank, he will co-ordinate his arrangements with those of his neighboring outpost commanders, and will ensure that no ground on his flanks remains unwatched. He will also arrange for co-operation and intercommunication both with the main body and between outpost troops, which, with the exercise of command, will be facilitated by placing the pickets along well-defined features or in the vicinity of roads; but this must not outweigh the necessity for the best tactical dispositions possible.

(iii) **Frontage.**—The extent of frontage to be allotted to each outpost company will depend on the probabilities of attack, the defensive capabilities of the outpost position, and, where they exist, on the number of approaches to be guarded. The limits of the frontage allotted to each company should be carefully defined, as in the case of sections of the outpost line.

(iv) **Reserves.**—The necessity, or otherwise, for the provision of a reserve depends on circumstances, such as the size of the force to be covered, the proximity of the enemy, the probability of attack, the time required by the troops protected to come into action in case of attack, the distance of the outposts from those troops, and the nature of the ground. It lies with the outpost commander to decide whether any of the troops allotted to him shall be used as a reserve.

(v) **Orders.**—As soon as the foregoing details have been decided on, an outpost commander will issue orders on the following points:

(*a*) Information of the enemy and our own troops so far as they affect the outposts.

(*b*) General line to be occupied by the outposts; frontage or number of roads allotted to each outpost company; and situation of the reserve.
(*c*) Disposition of outpost mounted troops.
(*d*) Dispositions in case of attack. Generally the outpost line of resistance and degree of resistance to be offered.
(*e*) Special arrangements by night.
(*f*) Smoking, lighting fires, and cooking.
(*g*) The hour at which outposts will be relieved.
(*h*) His own position.

If he finds it unnecessary to employ all the troops placed at his disposal, he will decide whether to retain the surplus as a reserve or to send them back to the main body. As soon as the outposts are in position he will inform the commander who appointed him. He will also be responsible for maintaining communication with the main body.

6. **Duties of the Commander of an Outpost Company.**—(i) The commander of an outpost company, having received his orders, will move his command, taking precautions against surprise, to the ground allotted to it, where the men will be halted under cover.

(ii) He will then examine the ground, decide on the number and position of the pickets and, if necessary, of detached posts, required by day and night, and on the position of the support. He will give instructions to the commanders of pickets and detached posts, and will arrange for a protracted resistance to be made on the line occupied by the pickets, which must correspond generally with the outpost line of resistance, indicated by the outpost commander, and should support, and be supported by, the companies on either flank. As soon as the pickets are in position and their groups and sentries posted, he will withdraw the covering troops. *Such troops as are required for night dispositions only should not be posted till after dark.*

(iii) **Patrols.**—If it is necessary to send out patrols he will make the required arrangements, deciding whether they

FIG. 8.—OUTPOST COMPANY. SUPPORTS TOLD OFF FOR VARIOUS DUTIES.

FIG. 9.—SUPPORTS READY TO REINFORCE PICKETS. LOOK-OUT FRONT AND REAR.

FIG. 10.—A PICKET—INSTANT READINESS.

FIG. 11.—SENTRY CHALLENGING.

[*Wrong method, see para* (*v.*) *p.* 70]

should be furnished by pickets or supports. When the troops who covered the company's advance to the outpost position are available, it is sometimes convenient that they, who already know something of the country in front, should be detailed for this duty.

(iv) **Intercommunication.**—He will communicate with the companies on the flanks of his position, and will ascertain the dispositions of those companies, so as to ensure no ground being unprotected. He will also maintain communication with the outpost commander.

7. **Scope of Training.**—No definite rule can be laid down regarding the scope of training in outpost duties in all circumstances. Instructors must use their discretion in this respect, and much will depend upon the numbers and ground available. As a general rule the best use will be made of ground, especially when it is restricted, and the greatest common benefit derived from training, if instruction is confined to the choice of positions for pickets and practice in the duties of scouts, patrols, and sentries by day and night. These duties are attractive and useful subjects of instruction. As in other branches of field training, the instruction in the work of outposts must necessarily be partial and limited in scope and should be confined to elementary schemes.

Section 13.—Pickets

1. **Duty of Pickets.**—The duty of pickets, aided by the remainder of the outposts if necessary, is to hold back the enemy in case of attack, so as to gain time for the main body to get under arms and carry out its commander's plan of action. Not more than a few men should be allowed to leave the picket for any purpose at one time. They should never be allowed to move about in or in front of the sentry line when seeking water, fuel, forage, etc. *Pickets will invariably be ready for action. By night the men must never lay aside their accoutrements.*

2. **Composition of Pickets and Supports.**—The outpost commander is responsible for making the arrangements in paras. 2, 3 and 4. Pickets, detached posts, and supports will as far as possible be composed of complete units, the supports consisting of those platoons or sections not required for pickets and detached posts.

3. **Distance Between Pickets and Supports.**—The distance of the support from the pickets will depend on the ground. The support should be able to reinforce the picket line rapidly when required, yet should be far enough away to prevent the men's rest being unnecessarily disturbed. When the company is watching a very extensive front it may be advisable to divide the support into two or more parts, or to detail a support to each picket.

4. **Communication Between Pickets and Supports.**—Communications between supports and pickets should be marked out in such a way that they can be followed easily at night without confusion. Every man of the support should be told exactly what he is to do in case of attack, and should be required while daylight lasts, to get a clear mental picture of his surroundings. Supports will maintain communication with their pickets, and, if there is one, with the reserve.

5. **Number of Pickets.**—The number of pickets required and the distance of pickets from one another will depend upon the nature of the ground and other circumstances. *It is essential that the pickets should command all the ground which offers the enemy suitable lines of advance to the outposts by day and night, and that they should be situated so that they can give each other mutual support.* As a general rule, in close country more pickets will be required by day, and they may be comparatively close to one another, while in open country fewer will be required, and they may be some distance apart. At night in close country in England it is usually sufficient to place a picket on each road or track leading to the outpost position, as it is practically impossible

for an enemy to advance in force except by these avenues of approach. Such pickets, however, should as a rule be of greater strength than those posted by day in ordinary circumstances, as darkness will prevent mutual support between adjoining pickets.

6. **Detached Posts.**—Detached posts from an outpost company may occasionally be necessary in front of, or to the extreme flank of, the line of resistance, to guard some spot where the enemy might collect preparatory to an attack, or which he might occupy for purposes of observation. They should only be employed in exceptional circumstances, owing to the danger of their being cut off. The strength of a detached post will depend on the duty required of it, and may vary from a section to a platoon. Detached posts act in the manner laid down for pickets and sentry groups. When only required for night dispositions, they should not be posted till after dusk.

7. **Position of Pickets.**—(i) *Primary Considerations.*—As already stated, the position of a line of pickets is usually selected for resistance by outpost troops in case of attack. *These positions, therefore, are primarily chosen with a view to defence*—that is to say, they must be the best defensive positions available. They must of course be chosen with relation to possible lines of approach by which the enemy may attack the outposts. They must also be chosen, especially in hilly undulating country, so as to prevent the enemy from occupying ground which commands the bivouac or camp of the main body. A good view is often an advantage for an outpost position to be held by day, but provided the enemy is kept under observation, or the ground in front is well watched by standing patrols, a view is of less importance than facilities for resistance in case of attack. *No fixed rules can be laid down regarding the choice of positions for pickets by day or night. In every case the best use must be made of ground according to circumstances.*

(ii) **Distance from Main Body.**—The actual distance between the main body and the position of the pickets must

depend in every case upon the nature of the ground, the time required for the main body to get under arms, and upon its commander's plan of action in case of attack. The larger the force the more time it will usually require to get under arms. In open country by day when the enemy may be able to interfere with the movement of the main body by firing at it at long range, it may be necessary to place the outposts farther from the main body than in hilly or close country when the enemy can only open fire at short range. *As a rule the position of the pickets should be as close as possible to the main body compatible with its safety so as to economize the numbers employed on outposts, which will increase with the distance between the main body and the outposts.*

(iii) **Day Positions.**—Remembering that no fixed rules can be laid down, the general principles in para. 7, may be applied to the choice of positions for pickets by day. Ground which commands the flanks of the position or from which the flanks may be threatened may be protected by detached posts.

(iv) **Night Positions.**—The principles governing the choice of day positions for pickets may have to be modified in the case of positions to be occupied by night to suit different conditions. *Positions which would be disadvantageous or untenable by day may be good by night.* Darkness will greatly restrict the field of fire, which should at least extend as far as it is possible to see on any particular occasion. Commanding ground will not be so important as by day, and positions for pickets at night may, with advantage, lie on low ground where shadow will afford concealment, while the approaching enemy will be rendered more or less visible against the sky on the crest of rising ground to the front of it. It is essential that pickets should be posted to guard all main approaches from the direction of the enemy towards the position.

Night positions may be chosen by day, but should not be occupied till after dark to avoid betraying them to the enemy.

If they are untenable by day the pickets should be moved to other positions just before dawn. The question whether night positions should be farther away from the main body or nearer to it than day positions must depend upon circumstances in each case. In changing day and night positions the number of pickets may be reduced or increased as may be necessary.

8. **Duties of Picket Commander.**—(i) As soon as a picket commander has received his orders he will move his command, by a covered approach, if possible, to a spot in rear of the portion of the picket line for which he is responsible. He will then examine the ground and decide on the number and position of sentry groups required, both by day and night, remembering that no more should be used than are absolutely necessary.

(ii) He will then explain his orders to the picket, and will detail the various duties and their reliefs, including one or more single sentries over the picket itself, for the purpose of communicating with the sentry groups and warning the picket in case of attack. He will satisfy himself that every man of his picket *knows the direction of the enemy, the position of the next pickets, and of the support, and what he is to do in case of attack by day or by night.* He will impress on his men the importance, where possible, of getting a clear mental picture of their surroundings while daylight lasts, so that they may the more easily find their way about by night.

(iii) He will then post his sentry groups, satisfying himself that no portion of the frontage allotted to him is left unwatched, and will instruct sentries and commanders of sentry groups on the points enumerated in para. 6, s. 14. He will maintain communication with the pickets on either flank, arranging with them for mutual support; and while limiting as much as possible any movements in the line of sentries which might be visible to the enemy, he will satisfy himself that the sentries are alert and understand their duties.

9. **Miscellaneous Duties.**—When the above arrange-

ments are completed, parties may be told off to prepare shelters, fetch water, and if cooking is allowed, to collect wood and prepare a field kitchen. Sanitary arrangements should always be provided. These various duties are dealt with in *Camps, Billets, Cooking* of this series.

10. **Instruction of Recruits.**—(i) The instruction of recruits in the choice of positions for pickets should be carried out according to the general directions contained in Chapter I, and on the lines laid down with regard to training in the choice of defensive positions. Subject to the discretion of commanding officers it may be confined to the choice and occupation of positions by one or more pickets. Training should be preceded by lectures regarding the function and duties of pickets. Lectures should include object lessons in the choice of positions by day and night illustrated with the aid of landscape targets or a black board.

(ii) Instruction must always be carried out on the ground in relation to a definite tactical situation. The direction of the enemy and the approximate position of the main body must always be stated. If the support which is being covered is imaginary its exact position should be indicated, and it will usually be advisable to point out the positions assumed to be occupied by the picket on either side. The greatest care must be taken to avoid teaching false lessons, and they must be made to realize the partial and limited nature of their training.

(iii) **Simple Obstacles.**—Instruction in strengthening positions has already been discussed. Where this instruction is not possible the men may be practised in constructing simple alarms, flares, or obstacles, such as some of those described in *Field Entrenchments.* A simple obstacle consists of a length of cord or wire stretched tight and pegged firmly to the ground about a foot above it a short distance in front of and along the position occupied by the pickets. Two or more such obstacles may with advantage be stretched along the ground at short intervals one behind the other. They will serve to trip up the advancing enemy or his scouts. Friendly

scouts and patrols must know the position of such obstacles and take care to avoid them.

Section 14.—Outpost Sentries

1. **General Remarks.**—By day and night a line of sentries is stationed beyond the pickets to protect them against surprise, and warn them of the approach of an enemy. *The commander of the picket gives each sentry a definite portion of ground to watch. Sentries should be so posted that that the ground to their front in the direction of the enemy within the area assigned to the picket is adequately watched by them.*

2. **Importance of Sentry Duty.**—*The duties of a sentry require trained eyesight and hearing, powers of quick observation and decision, great concentration of purpose and careful judgment.* These duties are obviously vitally important. Mistakes or carelessness on the part of sentries may expose the force they protect to the danger of a surprise attack. On the other hand, the nervousness, excitability, or over-zealousness of sentries may lead to false alarms. Such alarms will disturb the force unnecessarily when it should be resting. They will tend to react adversely on its morale and may perhaps betray the position of its outposts to the enemy. The fact that they are helped in their duties by patrols will not relieve sentries of their responsibility in any degree, and must never induce them to relax their vigilance for an instant.

3. **Number of Sentries.**—The number of sentries required will depend in every case upon the nature of the ground and other circumstances, including the numbers available. Usually fewer will be needed in open country and by day when the surrounding country can be seen for some distance, and more in close country and at night when darkness restricts the power of vision. By day in open country one sentry over the picket and one sentry group in front of it may often be all that is required.

4. **Sentry Groups.**—(i) Sentries in the first line are usually posted in groups of from three to eight men under a non-commissioned officer, or the oldest soldier, who acts as *Group Commander* (Figs. 12 and 13). In open country one man of each group is posted as a sentry, while the remainder lie down close at hand. In this case the group may consist of three only. At night or in close country or if special precautions are necessary, the sentry post may be doubled. Sentries should always be posted double when men are very tired. Except at night or in a fog bayonets should not be fixed.

(ii) **Reliefs.**—Groups usually remain on duty eight or twelve hours, and thus require no reliefs when the force is only halting for the night. Each sentry of a group remains on duty for a specified time, which should not be more than two hours, and may be less in the case of recruits. The sentry on duty is then relieved by one of the members of the group, whom he calls at the proper time in the absence of other arrangements with regard to relief. Reliefs should be arranged for sentries according to the discretion of their commanding officer, and as their duties are purely instructional more time than is necessary for learning them thoroughly should not be spent in performing them.

5. **Group Commanders.**—Commanders of sentry groups must in addition know what is to be done with persons found entering or leaving the outpost lines. They must also be given explicit orders what to do in case of an advance in force by the enemy—whether they are to remain at their posts, which in this case must be protected from fire from behind as well as from the front, or whether they are to retire on the picket. In the latter case they must be warned of the danger of arriving headlong on the picket only just ahead of the enemy. In consequence of this danger such retirements are rarely permissible at night.

6. **Duties of Sentries.**—(i) **Instructions.**—Every sentry before he is posted should be informed on the following points by the picket commander:

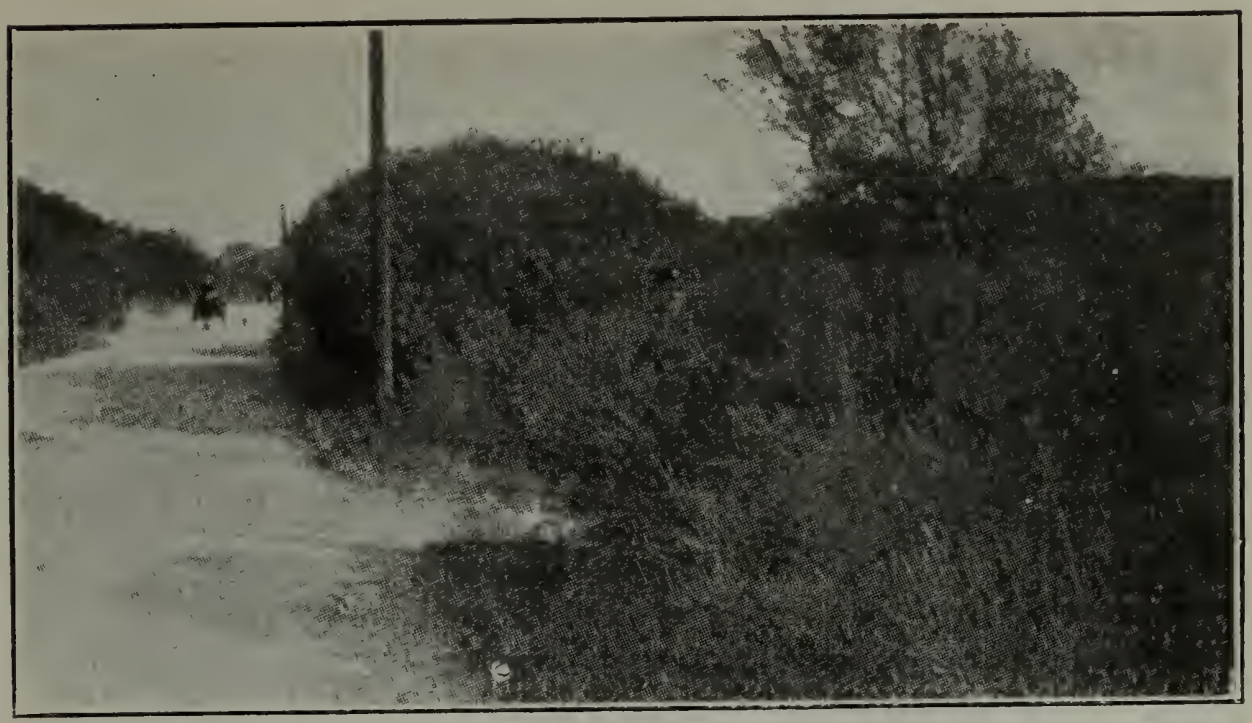


FIG. 12.—SENTRY GROUP WATCHING ROAD. ENEMY'S POINT OF VIEW.

FIG. 13.—AS ABOVE—SIDE VIEW.

FIG. 14.—SENTRY GROUP RECEIVING FLAG OF TRUCE.

FIG. 15.—BRINGING IN FLAG OF TRUCE.

(*a*) The direction of the enemy.
(*b*) The position of the sentries on his right and left and that of the picket, the neighboring pickets, and of any detached posts in the neighborhood.
(*c*) The exact portion of ground he is to watch.
(*d*) How to deal with persons approaching the post.
(*e*) Whether any friendly patrols or scouts may be expected to return through their portion of the line and the signal, if any, by which they may be recognized.
(*f*) In the day-time the names of all villages, rivers, etc., in view and the places to which roads and railways lead.

(ii) **Example of Order to Sentry Groups.**—*Sergeant A and you six men will form a sentry group of No.* 1 *picket, No.* 2 *outpost company. You know the direction of the enemy and the position of our own troops. The frontage you have to watch is from that post and rail fence on the right to C Farm but at night it is more particularly the road leading to X village about* 2 *miles off that must be looked to. I am placing you here under the tree so that you cannot be seen. No one is to approach the picket over the ground you* watch. *Make any one attempting to do so a prisoner, and and send him under escort to the picket. Your line of communication, and of retreat, to the picket, is by that gap in the hedge* 150 *yards north of the picket. Do you want to ask any questions?*

(iii) **Concealment.**—*To see and hear without being seen or heard is the first business of a sentry.* Whenever possible sentries should be posted behind suitable cover concealing them from the enemy's view (Figs. 12 and 13). In the open or when partly exposed to view they must avoid all unnecessary movements, as moving objects are always more conspicuous than those at rest. At night darkness or shadows may afford concealment, but men if motionless may be difficult to distinguish in the open, even in moonlight. They must, however, be careful to avoid betraying their position through

noise, which on a still night may travel far, or in other ways such as by the glint of moonlight on their arms and equipment. *Permission to lie down except to fire should only be given for special reasons, since sentries when lying down may not remain sufficiently alert.*

(iv) **Alarm.**—The sentry will immediately warn the group of the approach of any person or party. By day some time may elapse before persons observed will approach close enough to be recognized or challenged. If necessary the group commander will warn the picket to be prepared by signal or by despatching a member of the group to report. Meanwhile the group must take care to avoid betraying in any way the fact that it is aroused and is prepared to act.

(v) **Challenge.**—When the nearest person is within speaking distance, the sentry will call out "Halt!" take cover and get ready to fire. Fig. 11 illustrates a mistake. *The sentry should take cover before getting ready to fire.* On compliance with this order the group commander will question persons and deal with the situation according to the instructions received by him. Persons disobeying the sentry or attempting to escape after being challenged will be fired on without hesitation.

(vi) **Firing Without Challenge.**—As a rule in war, especially at night, the challenge will be dispensed with, and sentries will give the alarm at once by firing on suspicious persons approaching from the direction of the enemy.

(vii) **Firing.**—At night sentries should fire with eyes fixed on the enemy, no attempt being made to aim by aligning sights in the ordinary way. Recruit sentries, when unarmed or without blank ammunition for their rifles, should call out the word "Alarm" loudly, or indicate by some other prearranged signal that they are supposed to have fired on an approaching person or party.

(viii) **Prisoners and Flag of Truce.**—Persons presenting themselves at the outpost line, such as the bearer of a flag of truce (Figs. 14 and 15), and all prisoners captured will be

sent under escort, and if necessary blindfolded, to the commander of the outpost company, who will deal with them.

7. **Sentry Posts.**—(i) **By Day.**—*The primary consideration governing the choice of sentry posts by day is that sentries should be placed so as to gain a good view over the ground to their front.* Posts if possible should also provide cover for concealment. In other words the position of a sentry by day should enable him to see well over the ground he watches *without being seen.* By day or in moonlight sentries may with advantage be posted on high ground so that they may see as far as possible, care being taken in the absence of cover that they are not conspicuous. At night, when darkness restricts the power of vision, they may be posted on low ground in shadow for concealment facing high ground so that an enemy may be visible upon its crest and slope against the sky.

(ii) **By Night.**—In darkness sentries will depend upon hearing rather than sight. Positions must, therefore, be chosen to enable sentries to hear as well as possible according to circumstances. As a rule on still nights and if the wind blows from the direction of the enemy sound will be heard better on high than on low ground. If it can be avoided sentries should not be posted in places where sound will interfere with hearing as for instance, near running water or near trees in a wind. The degree of sound made by advancing troops will depend upon their numbers, training, and the nature of the ground. The distance at which noise made by the enemy can be heard by sentries will denpend upon the direction and strength of the wind and weather conditions generally. For instance, in heavy rain or high wind it will usually be extremely difficult to hear anything except perhaps in a lull. This may also be the case when the ground is favorable for movement and when the wind blows in the direction of the enemy.

(iii) **Distance from Pickets.**—The distance between sentry posts and their picket depends entirely on the nature of the ground. They must not, however, be so far in ad-

vance that they run undue risk of being cut off, and they must not be so close that, if surprised and rushed, the picket has no time to get ready for action and runs the danger of being swept back with them. The distance which is most likely to be such as to meet these two requirements must necessary vary in every case with the nature of the ground, but as a rough guide for instructors, it may be said that a sentry post should seldom be more than a quarter of a mile or less than a hundred yards from the picket which it covers.

(iv) **Obstacles.**—At night sentry groups may construct obstacles some distance in front of their position on ground just beyond their range of vision to warn them of the approach of the enemy. Such obstacles may consist of a trip wire or cord.

8. **Instruction of Recruits.**—(i) **Preliminary Training.**—The foundation of the sentry's training will be laid by instruction in the use of ground and cover contained in Chapters I and II. His sight, hearing, and powers of observation by day and night can be developed by the instruction laid down in Sections 17 and 21 and in sub-para. (iii) of this para. Practical instruction in sentry duties should be preceded by lectures fully explaining these duties. Lectures should include object lessons in the choice of positions for sentries by day and night illustrated with the aid of landscape targets or a black board.

(ii) **Progression of Training.**—Instruction on the ground will be carried out in relation to definite tactical situations on principles already described. In each case the direction of the enemy and the position of the pickets will be clearly indicated, the latter being marked by white flags or some other simple method. At first instruction should be limited to posting the sentries furnished by a single picket, and individual attention must be given to each sentry. Recruits will be encouraged to choose positions for themselves for occupation by day and night. They will give reasons for their choice of a position which will be criticised by the instructor with regard to the following considerations:—(*a*) relation

to position of picket, (*b*) distance from picket, (*c*) facilities for observation and hearing, (*d*) facilities for concealment, (*e*) attitude of the sentry while on duty, namely, standing, kneeling, or prone. At this stage recruits should also be practised by day and night in communicating with their pickets, giving the alarm and retiring to their picket.

(iii) **Observation.**—When recruits have been practised sufficiently in choosing positions for sentries under all conditions by day and night, a duty which requires considerable judgment to carry out satisfactorily, they will be trained in observation by the following method:

By Day. The instructor will station a number of men representing an enemy's scouts in previously determined concealed positions within the tract of ground supposed to be watched by the sentries under instruction who will be drawn up together at a spot chosen by the instructor. The positions of the enemy's scouts will be unknown to the sentries, but must be in their field of vision. The scouts will be ordered to expose themselves for a few seconds by standing up or moving slightly a given number of times within a given period of time. Alternatively they may be ordered to move across certain clearly defined open spaces from cover to cover at a given time, taking care to do so by correct methods. These movements will all be checked and noted by the instructor, who will arrange for them to be made so that an appreciable interval of time elapses between each of them. A sentry who observes any movement will at once notify the instructor, indicating with the hand and describing the spot at which he observed it. This exercise lends itself to attractive competitions in which movements must be noted by sentries in writing and checked by the instructor at the end of the competition.

By Night. Sentries may be practised in performing their duties at night by the aid of both sight and hearing according to the above method through the exercises described in Section 17.

Section 15.—Outpost Patrols

1. (i) Infantry patrols are used to obtain information of the enemy or of the ground in the vicinity of the force to which they belong. The strength of a patrol will depend upon the task allotted to it, and may consist of from two to eight men under an officer or non-commissioned officer. Infantry patrols may consist of *patrols* and *standing patrols.*

(ii) When mounted troops are in front it should seldom be necessary to send out infantry patrols by day unless the country is very thick or the weather misty. By night the majority of mounted troops will be withdrawn, a few standing patrols only being left out to watch either the enemy or distant points by which he might approach, and increased vigilance will then be necessary on the part of outpost companies. *In the absence of definite orders picket commanders are responsible for taking such action as they deem necessary for the security of their pickets.*

2. **Movements of Patrols.**—(i) Movements of patrols through the outpost line *should be as few as is consisteni with the performance of this duty.* By day movements through the outpost line may disclose the dispositions of the outposts, while by night there is great danger of returning patrols being shot by their own side.

(ii) Patrols should never be sent out in such regular sequence as will enable the enemy to foresee their movements. If a force halts more than one day in the same place the hours at which the patrols go out, except those which do so before sunrise, and also their route, should be changed daily. An outpost patrol, when going out, informs the nearest sentry of the direction it is taking and arranges some signal, such as a low whistle, which should be changed frequently, by which it may be recognized on its return. In the event of a patrol not returning when it is expected, another should be sent out.

3. **Orders to Patrols.**—(i) The officer who sends out a patrol must give the patrol leader definite and precise instruc-

tions as to the points on which information is required. He must also inform him of the probable movements of other friendly troops in the neighborhood, and must tell him what is already known of the country in which he is to operate, the length of time he may expect to be away, and the place to which reports are to be sent.

(ii) **Example of Order to Patrols.**—*"Sergeant K, take two men, proceed up the road as far as the detached post at A, ascertain if they have anything to report, then continue as far as B village, half a mile beyond the post. Try to ascertain if any of the enemy's scouts are in or near the village and then move back to the footpath through C farm. Avoid observation by inhabitants. Report to me here on your return. There are no other patrols out from this company at present. You may expect to be absent about an hour. If you do not return in an hour and a quarter I will send out another patrol to follow the same route."*

4. **Patrol Leader.**—After receiving his instructions, and forming his plan of action, the leader should explain the whole, or as much as may be desirable, to his subordinates, so that every man may know how to carry on the duty in the event of accidents. He should warn them that if captured they should refuse to give any information beyond stating their rank and name, and tell them that by international custom they cannot be punished for this refusal. No man should carry any written instructions or documents which would give information to the enemy.

5. **Duties of Patrols.**—(i) *Patrols are employed to supplement the work of sentries in obtaining information regarding the enemy and in warning outposts of his approach.*—As sentries may not leave their posts it may be impossible for them, even by day, especially in close or hilly country, to see all the ground to their front and flanks over which the enemy may approach the outposts or on which he may assemble preparatory to attacking them. Consequently patrols are sent out to reconnoitre such ground, the extent

of which will depend on the nature of the country, and may vary by day and night.

(ii) The duties of a patrol as regards observation are defined in Duties of Outposts, Sec. 12. The manner in which these duties are carried out may differ according to circumstances. For example, by day, in fairly open country it may only be necessary for a patrol to reach a position from which the whole ground to be reconnoitred may be seen without the necessity of further movement. At night in close country when, owing to the nature of the ground, it may be impossible for the enemy to move except along certain roads leading towards the outposts, standing patrols may be stationed to watch such roads. As a rule ground which the enemy can approach unseen or on which he may assemble preparatory to attack should be reconnoitred by patrols both day and night. *In all cases common sense will guide the conduct of patrols in the performance of their duties.*

6. **Previous Reconnaissance.**—By day, if a general view of the ground they are to reconnoitre can be obtained from the outpost line, patrol leaders should make a careful study of it before starting. *The previous reconnaissance by day of the ground over which patrols will move by night is even more important and useful, and should be carried out whenever possible,* landmarks and features of ground which may serve to guide them at night being noted. If they cannot actually traverse by day the route to be followed at night, they may reconnoitre it as far as possible from the best available position within the outpost line. The men carrying out such reconnaissance by day should be employed as leaders of patrols by night.

7. **Line of Advance.**—The line of advance from the outpost to the ground to be patrolled requires careful consideration on the part of patrol leaders. It need not necessarily be the shortest and most direct route to this objective. By day it should, if possible, be chosen so that patrols will not be seen leaving the outposts by the enemy's scouts

from positions they are likely to occupy—as, for instance, on commanding ground and behind suitable cover. The line of advance by day should also be chosen so that patrols can move from one to another along a series of positions which afford cover. The work of patrols will be rendered difficult and perhaps useless if the enemy is able to observe the direction of their movements, a possibility which also involves the danger of capture.

8. **Method of Advance.**—(i) Patrols should remember that their mission is not only to obtain information, but *to convey it safely and quickly to the authority who sent them out.* They should always endeavor, therefore, to move in such a formation that, if surprised, some of their number may be able to get back with the information gained. Sometimes it may be advantageous to extend laterally, and at other times, when, for example, a patrol is marching down a path or road through a wood, it may be better to extend from front to rear.

Their usual method of advance should be by bounds from cover to cover, every opportunity being taken to escape the notice of the enemy or of hostile inhabitants. They should keep as much as possible in the shadows, both by day and night. Any place likely to harbor an ambush, such as a wood, ravine or village, through which it may be necessary to pass, must be approached with caution, one or two men advancing first under the cover of the rifles of the remainder. The whole party should never rest together in the same spot, but one or more look-out men should invariably be posted at these times.

(ii) When moving in the dark, as in the case of night patrols or patrols sent out before daybreak, great care must be taken to move silently. In the presence of the enemy patrols should advance in a series of forward movements for short distances with frequent halts for listening and observation. Generally the best formation will be in single file with one or two advanced scouts in front, close enough to be seen by their comrades.

(iii) **Landmarks, Distances, and Direction.**—Every member of a patrol must take note of landmarks, distances, and direction as he moves, so that he may be able to find his way back to the outpost by himself either when carrying messages or in retreat. These precautions are especially important at night. As in recruit training distances will not be long, and the country will not as a rule be difficult; this task should not be beyond the powers of observation and memory of average men after they have completed the instruction in reconnaissance and observation laid down in Chapters II and IV of this book, and studied topography according to the course of instruction in *Map Reading* laid down in the *Signalling* section.

9. **Firing by Patrols.**—An infantry patrol should seldom use its rifles if its object can be achieved by other means. But it must be clearly understood that if a small party of the enemy is suddenly encountered, the assumption of a resolute offensive will often be the best course of action. If possible hostile scouts should be captured silently without firing, by being ambushed and surprised. Stratagem may be used to lead them into an ambush. When captured they should be disarmed, searched, and questioned in the hope of obtaining information.

10. **Standing Patrols.**—A standing patrol is a patrol sent out to remain at some definite spot to watch either the enemy, a road by which he might advance, or a locality where he could concentrate unseen. Standing patrols may be furnished by mounted troops or infantry. They are of the utmost value, especially at night, as they obviate constant movement. A standing patrol must be prepared to remain out for several hours. Its commander must arrange to send back an immediate report of any hostile movement observed, and, if the enemy advances in strength, he must, in default of other orders, retire on the picket line before becoming seriously engaged.

11. **Instruction of Recruits.**—The following is an ex-

ample of a practical method of instructing recruits in the work of patrols by day. The instructor having indicated the supposed direction of the enemy and the position of the pickets and sentries, will make recruits note the area of grounds to the front of the line of sentries which none of the sentries are able to watch from any point of view, owing to its conformation, or to cover and other features such as buildings.

He will then consider whether such ground can be used by the enemy to approach the outposts or to collect upon it preparatory to attacking them. He will train men from the first to note whether sentries can see the approach to such ground from the enemy's direction, as for instance the approach to a large hollow or to ground masked by trees or buildings. He will point out that if *the approach* to such ground from the enemy's direction can be seen by some of the sentries the fact that the sentries cannot watch the ground itself by day may be immaterial because the enemy's advance can be observed by some of them before he reaches it.

Having decided the exact area to be patrolled, the instructor will next discuss with the men the best line of advance to it. In doing this he will take into account the probable position of the enemy's scouts who may be watching the outposts and who may, therefore, see the patrol set out. He will invite opinions from his men as to the best line of advance and encourage criticism from their comrades. He will next choose a patrol from among the men and order it to advance along the line selected, the leader using his judgment as to rate, formation, method of advance and use of ground and cover. The patrol will be followed up by the rest of the men, the instructor criticizing its work, indicating faults and explaining what should have been done, giving reasons for his opinions.

When the patrol has reached its objective questions such as the line of retreat in case of necessity, and the best route for scouts returning with messages may be discussed,

the patrol leader and individual scouts being ordered to make up their minds on these points while their work is watched and criticized by the instructor and the other men. Training should be carried out on the above method with different patrols over as great a variety of ground as possible till all the men have had a certain amount of practical experience in the work of patrol under different conditions.

12. **Patrol Exercises.**—The following are examples of exercises for training men in the various duties of patrols by day and night. Objectives should be clearly defined on a map or on the ground and may be marked with white flags. An assistant instructor should be posted at each place to be visited to check times and criticize work. Recruits may be employed to represent hostile scouts, etc., in each of the exercises.

Day Patrols—(i) One N.C.O. and two men will move along the footpath to O House, then along the drive to the main London road. This they will cross and then examine the small copse, quarter of a mile to their north, returning via P Farm. Hour of start, 2 p.m. Probable time absent, 40 minutes. Object, examination of ground for hostile scouts.

(ii) Two men will proceed to knoll X, three quarters of a mile north-west. They will move as direct as possible, subject to keeping concealed from view from Y ridge. From the knoll they will endeavor to discover signs of a small body of the enemy reported near cross roads 600 yards to its west. Instructions for the outward journey will hold good for the return. Hour of start, 4.15 p.m. Should return by 5.15 p.m. Object, to verify report received from an inhabitant.

Night Patrols—(iii) Three men under the command of a scout will move along main road past the sentry post as far as road-bridge over stream M (half mile). They will cross stream, move down left bank for about 300 yards, recross stream by wooden footbridge, and return

by track joining main road at Red Lion public house. Hour of start, 8.40 p.m. Probable time absent, half an hour. Object, reconnaissance of approach which enemy might utilize.

(iv) One N.C.O. and three scouts will move out past the sentry group on the high road to village S, follow this road to Manor House (half mile), then branch off along the track leading south, which meets the high road again just beyond the village (one mile). They will reconnoitre the village and return by the high road. Hour of start, 9.15 p.m. Probable time absent, 50 minutes. Object, reconnaissance of specified locality for signs of enemy.

13. **Outpost Exercises.**—These may include the choice of positions for pickets and combine the duties of sentries and patrols. They may be carried out on the principle of Test 5 for scouts, Sec. 23. They should be based on simple tactical schemes in which each side is given a definite task capable of being performed within the time available. For example, one side may consist of a skeleton force ordered to advance towards the enemy's pickets whose patrols seek to locate this force and give warning of its approach in time for the pickets to be prepared to resist it.

Exercises will need careful supervision and umpiring by instructors for which arrangements must be made beforehand. During each exercise umpires will decide any question that may arise and declare the result. The work of both sides should be criticized and mistakes indicated either at the conclusion of the exercise or subsequently.

CHAPTER IV.

ELEMENTARY NIGHT OPERATIONS

Section 16.—General Information

1. **Nature of Night Operations.**—Night operations may be described generally under three heads, namely, Night Marches, Night Advances, and Night Assaults. Surprise in some form is usually one of the objects of night operations.

(i) **Night Marches.**—Night marches may be made in order to gain time or to surprise the enemy. They are often made in hot weather to avoid marching in the heat of the day. They are also made to escape the observation of air-scouts. The employment of aircraft for reconnaissance makes it increasingly difficult for a commander to insure secrecy by day with regard to the movements of his force which the screen of his advanced troops formerly sufficed to preserve. Consequently night marches to escape the observation of air-scouts under the cloak of darkness are now frequent.

(ii) **Night Advances.**—Night advances are movements by a force which is deployed for battle across ground which it would be difficult or costly to cross by daylight, owing to the enemy's fire. The object is usually to reach a position from which an attack can be begun in daylight.

(iii) **Night Assaults.**—Night assaults are delivered against an enemy under cover of darkness. Owing to the difficulty of combining the attacks of the various parts of a large force in the dark, night assaults are usually carried out by comparatively small forces against some definite ob-

jective, such as a village, fieldwork or wood held by the enemy. Night marches and night advances on the other hand may be carried out by large forces.

2. **Scope of Training.**—Recruit training in night operations should be confined to the simple scheme of elementary instruction in this chapter, the object of which is to develop the powers of sight and hearing for use in the dark, and to train men to move noiselessly and keep direction in the dark. Tactical exercises are confined to night reconnaissance and night marches. As a rule night advances and night assaults will lie outside the practical scope of recruit training.

This applies equally to training in carrying entrenching tools silently and constructing various types of defences in the dark as silently as possible, which is an important part of the soldier's training for his duties in night operations. When opportunities, however, occur the men may, at the discretion of instructors, be practised in constructing simple trenches silently at night. Training for night operations will prove very attractive to recruits and help them to develop powers of nerve-control, discipline, resource and observation.

3. **Method of Training.**—Instruction should be carried out on the principles described at length in preceding chapters with regard to other branches of field training. It should be preceded by a course of lectures dealing specially with the night duties in which recruits will be trained. Practical training should begin during recruit training. If possible the men should be practised thoroughly in the training laid down in this chapter during company training in attack and defence, and before instruction in outpost duties by night is attempted. Progress should be very gradual and as much variety as possible must be introduced into instruction. The seasons during which hours of daylight are short are favorable for night training, *but this important branch of instruction should be carried out regularly throughout the year so as to practise recruits in it under*

all conditions of darkness, weather, and ground. Methods of training are dealt with more fully in the following sections of this chapter.

4. **Ground.**—Every effort should be made to provide the ground and facilities necessary for training in night operations. To some extent, as in the case of sight and hearing, training can be carried out in private or public gardens, country roads or any small area of natural ground. As a rule a smaller area of ground will suffice for training in night operations as compared with that required for field training by day.

Section 17.—Training the Eyesight and Hearing

1. **Training the Eyesight.**—It should be explained that:

(i) Ability to see in the dark increases with practice.

(ii) Objects are more visible when the moon is behind the observer than when it is in front of him.

(iii) An observer may stand up when he has a definite background and should lie down when he has not.

2. **Method of Training.**—(i) Instructions should be carried out in moonlight, starlight and darkness on every variety of ground in all conditions of weather. The men should be trained in sections or small numbers. Exercises should begin by teaching the men to make the best use of existing ground and cover for observation in a given direction according to the light and other conditions. The men will be practised in doing this in turns, their work being criticized by the instructor and faults corrected.

(ii) When recruits have been taught to assist the eye in observing, as far as possible by selecting a good position and assuming a correct attitude, the eye itself must be trained to observe at night under all conditions. One man of a section should march away and be stopped by voice or prearranged signal as soon as he is out of sight. He should call out the number of paces he has taken. The same man should then advance towards the section from some distance

farther off, and be stopped as soon as he becomes visible, later counting his paces to the section. When the recruits have been practised in observing a man approaching at an ordinary walk they should be similarly practised in observing a man who is endeavoring to approach unseen.

(iii) **Competitions.**—The above exercises can readily be made the subject of attractive competitions which should be organized by instructors periodically with a view to testing the powers of the men and stimulating interest in their work.

3. **Training the Hearing.**—(i) The hearing, like the sight, should be trained in all seasons of the year under the greatest possible variety of conditions with regard to ground and weather.

(ii) **Rules for Listening at Night.**—As a rule it is easier to hear sounds on soft ground when standing, and on hard ground when prone with the ear close to the ground. The choice of positions to facilitate hearing at night is dealt with in para. 7, sec. 14. It is impossible to lay down rigid rules for listening as much will depend upon the direction of the wind and other conditions in every case.

(iii) **Method of Training.**—(a) The men should be trained in sections or small numbers. Listening should be practised under different conditions on various kinds of ground and country, as for example, in open and enclosed country, across valleys, in hollows and in woods. The effect of different kinds of ground and country upon sound, together with the effect of the wind upon sound, should be noted and explained. To begin with recruits should be accustomed to noting and recognizing the ordinary natural sounds at night in any kind of country under different conditions of wind and weather. This will help them to recognize strange or unfamiliar sounds more easily.

(*b*) Recruits should be taught to facilitate listening for sounds by assuming the correct attitude and when possible taking up the best position according to the ground and weather conditions. They should then be practised in listen-

ing for the approach of an enemy by arranging for men to approach the squad at first singly and then in small bodies, such as a patrol, from directions which are unknown to it, but known to the instructor. At first the approaching person or persons should move in ordinary quick time without taking precautions to avoid noise so as to enable the men to recognize the ordinary sounds made by persons approaching them at night. Subsequently they should approach as noiselessly as possible.

(*c*) Instructors must make suitable arrangements for the conduct of listening exercises. They must decide the different directions from which each person or patrol is to approach and arrange for them to approach in turn at stated intervals of time. They must arrange whether persons and patrols are to approach one by one or whether two or more persons or patrols are to approach simultaneously. They must also make arrangements for listening men to record sounds. For example, instructors may direct the men on hearing a person approaching to call out "Halt!" and then to indicate the direction of the sound to him in a whisper. The instructor may record his report without comment of any kind and then order the exercise to proceed by a whistle signal according to the arrangements he has made. Men being challenged will halt until the instructor signals for the exercise to proceed, when they will act as directed.

(d) **Estimating Numbers by Listening.**—Soldiers are practised in listening to the sound made by bodies of troops on the march and estimating their numbers from the volume of sound. At the discretion of commanding officers the men may carry out this instruction in connection with the training in marching by night and day.

Section 18.—Night Marches

1. **Scope of Training.**—Instruction in moving noiselessly, putting on equipment noiselessly in the dark, falling in noiselessly on commands whispered or given in low tones at

night, and passing verbal messages in whispers will be included in the scope of instruction in this section and will precede training in night marches. These marches should be carried out by each unit separately. The training of different bodies to march together at night, keeping correct intervals and alignment with one another by means of communicating files or ropes is unsuitable for recruit training and is better carried out by companies marching together in battalion training.

2. **Training in Moving Noiselessly.**—Recruits should be trained in this work in sections before they attempt it in platoons or companies and at first without equipment or arms. They must be practised in moving over every variety of ground under all conditions of darkness and weather till they are able to do so noiselessly. Competitions between rival squads in moving noiselessly at night over country under equal conditions may be introduced into training with advantage.

3. **Rules for Moving Noiselessly.**—(i) The following rules must be observed in training recruits to move noiselessly:

(*a*) When moving in short grass or on hard ground the toe should touch the ground first and the foot be raised higher than normally.

(*b*) In long grass the pace should be slow and the heel be placed on the ground before the toe.

(*c*) Precautions must be taken to prevent equipment rattling.

(*d*) Rifles must not be allowed to clash against those of other men and must be placed noiselessly on the shoulders and ground in sloping and ordering arms.

(ii) Although precautions to avoid noise when moving will be more necessary in close proximity to the enemy on still nights, or when the wind blows in the direction of the enemy, and on rough or broken ground than will be the

case at a distance from the enemy, on ground favorable for movement at night, when the wind blows from the direction of the enemy or during storms when the sound of the elements may prevent the noise of movement from being heard, instructors should make it a rule in training never to allow the men to relax their caution or become careless when moving under any condition of ground or weather.

4. **Putting on Equipment Noiselessly.**—A definite order of putting on equipment should be determined and the men practised in putting it on noiselessly first by day and then by night. The equipment of every man will be at hand, as will be the case in camp or bivouac. During camp training or at other favorable times the ability of the men to put on their equipment quickly and noiselessly in darkness should be tested unexpectedly and noiselessly in darkness should be tested unexpectedly by night alarm.

5. **Falling in Noiselessly.**—Recruits should next be practised in falling in quickly and noiselessly in the dark. They must be trained to number off in whispers or low tones, to handle their arms without noise, and to obey words of command whispered or spoken in low tones. They should be practised in these duties first in sections and then in companies.

6. **Intercommunication and Verbal Messages.**—Recruits should be trained in passing messages in a whisper from ground to rear and *vice versa,* the final message received being checked with the original in order to detect mistakes.

7. **Training in Night Marching.**—(i) **Progression.**—The progression of training should be gradual. Recruits should be practised in marching along roads and over easy ground for short distances. The pace should be regulated to suit conditions of ground and light. When the men are accustomed to the conditions of marching at night, distances may be increased and leaders practised in guiding platoons and companies along roads or across country from point to point within a stated time.

(ii) Method of Training.—Leaders should first be trained to guide their commands across country by night by the use of compass, map and stars, according to the instruction in Map Reading in *Signalling*. Before starting they should be shown on the map their starting place, objective and line of route, which need be neither direct nor straight, and should be allowed to take all necessary bearings with the aid of the map and compass. They should also note on the map any natural or other features which may help them as guides to direction. For the march leaders should be provided with a watch, map, compass* and matches or other means of obtaining light. They should synchronise their watches, which will be useful to regulate pace and the time of starting and arriving. They must take the greatest care to screen completely any light they may use for looking at their watch, map or compass, to avoid betraying their position to the enemy.

A practical method of training is to arrange for different sections, platoons or companies to start from two or more different places and converge by different routes along roads or across country on a common objective which must be reached at a given time. Instruction in night marching may also be combined with the training of night patrols and the training of scouts. For example, the objective may be ground near an enemy's outposts on which the force is to deploy at the end of a night march preparatory to an assault upon the pickets. The enemy's patrols will try to locate the force and give warning of its approach, while its own scouts will accompany the force to assist its advance and protect it against surprise (see Test 5, sec. 23).

Section 19.—Night Reconnaissance

1. **Instruction of Recruits.**—Recruits will be trained in the work of reconnaissance at night, which is carried out before night advances and attacks. Instruction may be carried out in the same manner in which soldiers are trained.

* For use of the Service Prismatic Compass for night marches see *Signalling*.

2. **Day Reconnaissance.**—Some conspicuous feature of country, such as a wood, village, or a position marked by white flags, if possible about 1000 or at least 600 yards away, should be indicated during daylight as the objective for a night attack. The instructor should teach men to survey the approach to this objective by day. For this survey they must not be allowed to approach nearer to the position indicated as the objective than a point from which they might hope to avoid detection in daylight. They must take special note of the best natural and other features of ground as guides to direction. Features which are easily recognized should be chosen if possible, and on dark nights it is important that their nature, background or position should make them as easy as possible to observe; as, for example, a white house or a tree on a sky-line. The rise and fall of the ground, if carefully noted, may also help men to keep direction. Men should be trained to make written or mental notes of these and other important points during the day reconnoissance, and should be questioned regarding them before they carry out the reconnaissance at night.

3. **Method of Advance.**—After dark, men, working in pairs under the supervision of the instructor, should be made to advance towards the objective from the point at which the reconnaissance was made by day. If there is sufficient light to render this precaution necessary, careful use should be made of ground and cover and the advance carried out as far as possible in shadow. Patches of bright moonlight should be avoided, and when this is not possible they should be crossed quickly. All movements must be made as noiselessly as possible. When men become more proficient less conspicuous objectives may be chosen, the distances may be increased and lines of approach chosen over more difficult ground. In these exercises the bearings of the objective and landmarks may be noted beforehand, and the stars, when possible, also used as guides to direction.

CHAPTER V.

INFANTRY SCOUTING

Section 20.—General Information

1. **Importance of Scouting.**—Knowledge regarding the enemy's position, strength and movements is necessary alike for generals commanding armies and leaders commanding small bodies of troops before they can move or rest safely and act with certainty. This knowledge is obtained for commanders by scouts reconnoitring in air-craft, on horses and cycles and on foot. Their work is often difficult and it is always responsible and important in the highest degree.

2. **Infantry Scouts.**—Infantry scouts work on foot, and usually operate near the force to which they belong. When more extended reconnaissance is required it will be carried out by mounted men or cyclists specially detailed for this purpose.

3. **Company Scouts.**—One non-commissioned officer and four men in each company will be specially trained as company scouts.

4. **Qualifications for Scouts.**—The following are the qualifications for scouts in the British Army:

(i) Know how to observe.
(ii) Be able to read a map easily.
(iii) Know what to report on, and how to make a report.
(iv) Be able to express himself clearly and concisely.
(v) Possess good sight and know how to use his eyes and ears.
(vi) Be self-reliant, resourceful and prepared to take risks.

(vii) Understand semaphore signalling, and, if possible, be acquainted with all methods of visual signalling.

(viii) Thoroughly understand the use of ground; be able to move about and see without being seen.

(ix) Be able to judge distance accurately and estimate numbers correctly.

(x) Be able to form sound conclusions from signs, such as clouds of dust footprints, and so on.

(xi) Understand how to guide himself by compass, by the sun and by stars.

(xii) Be of thoroughly sound physique and in good condition.

5. **Recruit Scouts.**—(i) A recruit scout in addition should be chosen for the following qualifications:

(*a*) Able to swim.

(*b*) A good shot.

(*c*) Able to light a fire, prepare and cook simple rations in his mess tin.

(*d*) Able to make good simple field sketches.

(ii) **Scheme of Instruction.**—A scheme of training covering the qualifications for scouts mentioned in paras. 4 and 5 is laid down in the various manuals of this series. The qualifications mentioned in paras. 4 (ix) and 5 (*b*) and (*c*) are dealt with in the *Musketry* and in *Camps, Billets, Cooking* manuals, respectively, while those mentioned in paras. 4 (ii) and (vii) are dealt with in the *Signalling,* which also contains the instructions in para. 4 (xi). The various qualifications mentioned in paras. 4 (i) (iii) (iv) (v) and (viii) inclusive are the subject of training in different chapters of this book and in *Signalling* (Carrying Dispatches).

(iii) With regard to qualification in para. 4 (ix) and (x) above, only practice will enable recruits to estimate the number of a body of troops, recognize the dust raised by infantry, cavalry, artillery and transport of various kinds, as well as to form sound conclusions from foot-prints and other signs. Instruction in these duties, however, may be carried out according to arrangements made by commandinfig officers.

(iv) The training of scouts will be carried out principally during the period of individual training. *During peace operations scouts should not be allowed to employ methods which would be impossible in war.* The methods to be adopted in the training of scouts are left to the officers concerned. The standard to be aimed at is that a scout should fulfill the conditions defined in paras. 4 and 5 (i). A series of tests of proficiency for scouts is contained in Section 23.

(v) **Equipment.**—The equipment of a scout should include a watch, a map of the locality, a compass, pencils and a notebook for making reports and field sketches, a pocket knife and field glasses.

6. **Orders to Scouts.**—The value of the work of scouts will depend to a great extent on the orders they receive from their commander before they are despatched on a particular duty. A commander must assign a particular objective and duty to each party of scouts sent out. He must state the exact information he requires from them clearly, and may do so in the form of definite questions which they must try to answer accurately. The commander must make arrangements for the scouts to communicate to him rapidly the information they obtain, and he must also make arrangements for communicating such information to the commander of the force. Examples of duties which may be the subject of orders to scouts will be found in Tests 4 and 5, Sec. 23. *The function of scouts is to observe and report, and when engaged on their special duties they will use their rifles only in self-defence.*

7. **Scouts with Troops on the March.**—No specific mission can as a rule be assigned to scouts covering the advance of troops on the march. Their training may be combined with the instruction in marching by day and night, and should be limited to simple exercises to protect the marching force against surprise, assist its advance at night by looking for natural and other obstacles in its path, and help it to keep direction. Scouts in pairs should be sent out to protect the force in front and on each flank. Each pair must regu-

late its movements both as regards rate and halts for observation to suit that of the force to which they belong.

As a rule scouts will move forward to positions at which they can halt and observe enough of the ground to the front and flanks to insure the safety of the force till it reaches a certain point and then again move forward to other suitable positions before the force reaches this point. Scouts, however, must adapt their methods in every case to suit circumstances. The distance of scouts from the force must depend upon the nature of the ground, and will usually be farther away from it in open country and by day than in close country and by night. Scouts must make skilful use of ground and cover in moving and selecting suitable positions for observation.

Section 21.—Training in Observation and Memory

1. The conditions of modern warfare demand from the individual soldier highly developed powers of observation and memory. Accordingly training in observation and memory is an important part of the scout's instruction as well as that of all recruits.

2. **Method of Training.**—(i) *Landscape Targets.*—The following suggestions are made as to methods of training in observation and memory. Training is best carried out in the field. In towns or in the absence of adequate facilities in the shape of ground training can be carried out indoors and in the evening with Solano targets and landscape targets. When this is done training may conveniently be combined with the course of instruction in visual training, military vocabulary, etc. Instruction should begin if possible during recruit training, and should be continued until field training is begun. It may be combined with instruction in marching. Training in observation and memory lends itself readily to attractive competitions, which should be organized periodically.

(ii) **Training at Home.**—Recruits may also train their

powers of observation and memory at home in a variety of ways. For instance, a friend may place a number of different objects on a table and cover them with a cloth. The cloth with be withdrawn for half a minute and then replaced. The recruit will then write down the names of the objects on the table. Afterwards the cloth will again be withdrawn and the answers checked.

(iii) Another example of such practices at home consists of allowing recruits to enter a room for half a minute and note the nature and number of all the articles in it of a given color, after which they will leave the room and write down a list of such articles together with their position. The list can afterwards be checked in the room.

(iv) **Training in the Field.**—Training in the field may be carried out in the following manner. Recruits will be drawn up in line facing a tract of country. Part of the country lying between two clearly defined points marking its limits will be indicated. Recruits will be allowed a minute for observing and remembering its principal natural and other features. They will then be turned with their backs to the country and describe these features in short verbal or written reports as far as possible in military vocabulary. For example—"*The ground slopes gently down for about* 600 *yards to a brook with willow trees along its banks, and then rises steeply. There is a farm with red roofs about* 900 *yards half left. About* 800 *yards straight to the front are three large grass fields. In the one to the right is a flock of sheep, and in the centre field are five horses,*" etc. etc. These exercises may also be carried out with *landscape targets.*

(v) Training may also be carried out when marching as follows: Recruits may be instructed to observe and remember everything along the route of military value, such as the names of villages through which they pass, the number and position of post and telegraph offices, smithies, inns, and bakeries, and the number of cross-roads and the places to which they lead. The results of their observation should be

written down and checked by the instructor from his own notes.

(vi) **Progression of Training.**—The difficulty of the tests should be increased gradually. When recruits are sufficiently progressed the time allowed for observation should be gradually reduced. As their power of memory increases the time which elapses between the observation and the report upon its results should also gradually be increased. No fixed rules can be laid down regarding the above points, and instructors must use their discretion with regard to the rate of progression. The tests should never be made too severe. The best results will be obtained from training if the interest of the men is maintained and competitive and recreative elements are introduced into it.

Section 22.—Reports and Field Sketching

1. **Reports.**—The information required from scouts may necessitate written as well as verbal reports. Instruction in writing military reports illustrated by field sketches is therefore included in the training of recruit scouts. Reports should only be sent verbally when they are short and contain no information of great value or when they cannot be sent in writing. Verbal reports should be confirmed in writing as soon as possible if important.

2. **Rules for Writing Reports.**—The following rules are laid down for written reports in the British Army. *The principle underlying them is that every precaution should be taken to assist the recipient of a report to grasp its meaning with the minimum of trouble and delay.*

(i) **General Instructions.**—Reports will begin with the rank, name or description and address of the addressee followed by the date, and must be signed clearly with the name and rank of the sender. They must be written in short numbered paragraphs. They must be precise as regards time and place of sending.

(ii) **Clearness of Expression.**—The language should be simple and concise, and the handwriting easily legible. Clearness of expression and freedom from any possibility of misunderstanding is more important than literary form. Anything of an indefinite or conditional nature such as "dawn," "dusk," "if possible," "if practicable," "should," "may," is to be avoided.

(iii) **Time.**—The hours of 12 will be followed by "noon" or "midnight" written in words. A night will be referred to thus:—*Night 29/30 Sept.; or Night* CJ *Sept. / 1 Oct.*

(iv) **Names.**—Names of places and persons will be written in block capitals, e.g., LONDON or WELLINGTON and must be spelt exactly as given on the map in use. Great care is necessary to prevent possible misunderstanding resulting from the existence of two or more places of the same name.

(v) **Positions of Places.**—If a map is referred to, the one used must be specified. The position of places will as a rule, be denoted either by the points of the compass, e.g. *wood, 600 yards S.E. of TETSWORTH,* or when no points of reference are available by actual compass bearings, e.g. *hill,* 1,500 *yards true bearing 272 deg. from CHOBHAM Church,* or by descriptions, e.g. *cross roads ½ mile S.W. of the second E in HASELEY,* the letter indicated being underlined. The compass bearing will always be the true-bearing and must invariably be described as such.

(vi) **Indicating Road.**—A road is best indicated by the names of places on it, care being taken to name sufficient places to insure that the road intended is followed.

(vii) **"Right" and "Left," etc.**—A position is best described from right to left looking in the direction of the enemy. The terms "right" and "left" are used in describing river banks it being assumed that the writer is looking downstream. Except in the foregoing case, indefinite or ambiguous terms such as "right," "left," "before," "behind," "beyond," "front," "rear," "on this side of," must not be used, unless it is made quite clear to what they refer.

(viii) **Precautions.**—The writer having finished his report should read it carefully through at least once, and, if possible, get some one else to read it in order to assure himself that it is clear.

3. **Example of a Report.**—Subjects for reports by scouts will be found in Tests 4 and 5, Sec. 23. The following is an example of a report made by a scout:

"To the O.C., C Company 1st Ryl. Fusiliers, Leather Bottle In, Cobham. No. 13. June 25th, 1913. (References to ½ inch ordnance survey map, sheet 39.)

(1) Arrived here from Cobham 2 p.m. Roads heavy. Found Singlewell-Gravesend telegraph cut.

(2) Two battalions enemy's infantry passed along Watling Street towards Gravesend at 2.30 p.m. No further signs of enemy's troops.

(3) Am proceeding to Chalk village. Will await further orders there.

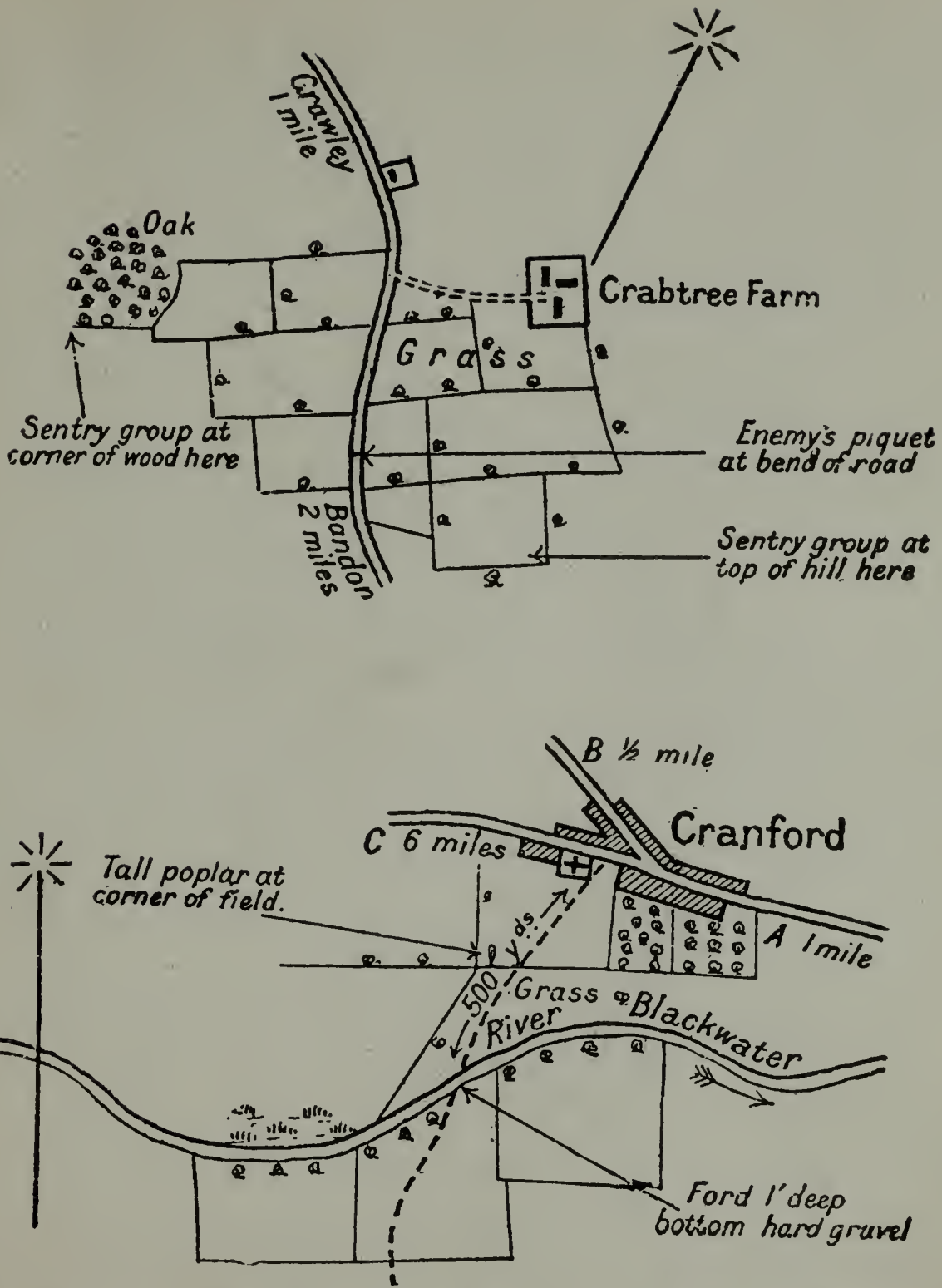
E. Purt, Cpl.,
1st Ryl. Fusiliers,
Orchard Farm, Singlewell.

Dispatched 2.45 p.m.
by Ptc. D. Gerds on foot."

If an ordnance survey map is referred to, the number of the sheet or sheets containing the places mentioned must be given. Tracts of country may be referred to by mentioning a particular square on a sheet of the map containing a large town or towns, as for instance, "Square Rochester-Chatham."

4. **Field Sketches.**—(i) A field sketch is a sketch of ground made with such instruments and under such conditions regarding time, weather, etc., as generally exist in the field. A field sketch should show all the features of country natural and artificial, which are of importance from a military point of view, i.e. those which might affect the dispositions, movements, security, or supply of troops.

(ii) Recruit scouts must be trained to make small, *simple,* pencil field sketches to illustrate or supplement information in their reports. Important distances such as those



Sketch Showing Position of Ford Near Cranford.

FIG. 16.—EXAMPLES OF FIELD SKETCHES.

recorded on milestones along roads may be noted on a sketch (Fig. 16), but no attempt must be made to draw sketches accurately to scale. It will not matter how rough sketches are so long as they are clear and accurate as to necessary detail. In many cases they may help to convey information to the recipient at a glance, which, if written, would require much time and labor and then fail to be as clear as a sketch. Instruction in sketching should be carried out in the field. It may also be carried out indoors with the aid of landscape targets or maps. Pencils of different colors should be used for drawing, but they must not be "indelible" as the mark of such pencils runs badly if wet.

5. **Rules for Field Sketches.**—(i) **Conventional Signs.***—Conventional signs should be simple in character and not numerous. It is far better to write descriptions on the face of a sketch or on the outer margin joined to the object by a thin line, in language that cannot be mistaken, than to crowd it with symbols of which the meaning is liable to be misunderstood.

(ii) **Roads and Railways.**—Roads and railways cut by the margin should have the name of the nearest important town or village off the sketch written along them at each end, together with their distance from the point of the road or railway at the margin. Roads less than 14 feet wide will not permit the simultaneous passage in opposite directions of two lines of ordinary wheeled traffic.

(iii) **Rivers.**—A river or stream should be colored blue and have its name written along its course and the direction of its current indicated by an arrow. Its estimated width and whether it is fordable or not should be noted on the sketch.

(iv) **Bridges.**—The nature of a bridge is indicated by the

* The conventional signs used in field sketches are practically identical with those used in maps, and are shown in the Plate, which should be studied in connection with these rules. The words *To* and *From* shown on the Plate with respect to the direction of roads and railways are not now used in field sketches, the particulars mentioned in para. 5 (ii) above only being noted (Fig. 16).

words "iron," "stone," "wood," "suspension," etc., written alongside or marginally noted (see Plate).

(v) **Woods.**—In the case of woods it should be noted in writing whether they are passable for troops of all arms or not; also their nature, whether of "fir," "oak," etc. The degree of cover they afford should be stated.

(vi) **Post Offices, Signposts, etc.**—Post offices are distinguished by the letter P., telegraph offices by the letter T., signposts by S.P., and "forges" or "smithies" should be written in full.

(vii) **Troops.**—It may occasionally be necessary to show the disposition of troops on a military sketch, as for instance on a sketch of an outpost or defensive position, but it is not desirable to spend time in drawing troops in any formation to scale. In outpost sketches the letters P.S.R. may be written instead of picket, support, and reserve. The direction of a patrol is shown by an arrow.

(viii) **Lettering.**—Lettering must be easily legible, not interfere with detail, and show clearly to what it refers. Names of towns, villages and rivers should be in block letters. All lettering should be horizontal, except the names and direction of rivers. railways, roads and canals, which should be written along them, also words descriptive of the nature and condition of tracts of country, which should be written so as to, as far as possible, extend over the portion of ground described. For examples of all the above see Plate.

Section 23.—Proficiency Tests for Scouts

The following examples of tests for recruit scouts are suggested for the guidance of instructors. They will serve either for the examination of recruits applying for appointment as scouts or to test the proficiency of scouts. They will also serve as the conditions of competitions in the various duties of scouts. To these tests may be added the Dispatch Carrying competition contained in *Signalling*. Tests may be carried out both by day and night.

Test 1.—Map Reading.—Scouts should be taken to some selected position, preferably in country with which they are not familiar, whence a good view is obtainable. Prominent objects marked on the map, such as church spires, bridges, prominent buildings, woods, railway cuttings, etc., which are visible from the selected position, should be chosen.

The objects chosen should be pointed out on the ground and the scouts then asked to ascertain the range to them in yards by use of the map.

This test requires the scout to be able to identify his position on the map. to recognize objects marked on the map, on the ground, to identify these objects by setting his map and to be able to use the scale. It is, therefore, a comprehensive test of map reading

Test 2.—Finding the Way Across Country.—Scouts should be taken to some selected position from which some prominent point on the map such as the top of a hill, a wood or a group of buildings about a mile distant is clearly visible. This point should be indicated by reference to the map and not to the ground. Each scout should be directed to proceed to it independently.

This test may be carried out both by day and by night. In the latter case scouts must be allowed to study the ground by day. A scout should be able to find his way across country in daylight at the rate of three miles an hour and by night he should be able to follow a route he has previously traversed by day at two miles an hour. It is advisable to have two instructors for this test, one at the starting point who should note the times of departure, the other at the destination who should note the times of arrival. A time limit may be fixed for the completion of the journey at the discretion of the instructor.

These tests may be carried out by the scouts with or without the use of compass and map to help them during the journey. In the latter case they must depend alone upon landmarks and natural or other features of the ground as guides to direction, together with stars at night.

Test 3.—Moving Across Country Unseen.—A few recruits should be placed in a selected defensive position to represent a skeleton force holding it. Scouts should be directed to work towards it, across a tract of country lying within definite limits on either flank of the position.

The starting point may conveniently be about 1,200 yards from the position. Over ordinary close country the whole body of scouts should be required to get up to 600 yards of the position in daylight without exposing themselves to say three aimed shots at any of their number during the entire advance. The above conditions may be varied according to the nature of the country and other considerations at the discretion of instructors.

Test 4.—Reports on Ground and Country.—(i) A stretch of river in which a ford, footbridge or ferry is known to exist may be selected and scouts ordered to find a point of passage across it and report on it accurately.

(ii) A thick wood may be chosen and scouts ordered to find and describe a way through it.

(iii) Scouts may be ordered to discover and describe a footpath across enclosed country.

(iv) Scouts may be sent to a village to ascertain some definite information regarding it, such as the places with which it is in telegraphic or telephonic communication, the number and exact position of the provision shops, forge, doctors' houses, etc.

Test 5.—Reports Regarding the Enemy.—A few recruits may be posted representing a picket which has thrown out a couple of sentry posts. Scouts will be despatched towards them from a distance of about a mile, with orders to try to locate the picket without being observed. The distance to which scouts are allowed to move to the right and left off the direct line must be definitely limited. Otherwise they could make a wide detour and get round and behind the picket without risk of being seen, which would not be possible in war owing to the presence of other pickets.

The sentries and any patrols sent from the picket should

be instructed to endeavor to capture or in the day-time to fire at close range at the scouts, and any scout who is captured or exposes himself to fire should be disqualified.

Note.—Reports may be made either verbally or in writing. It is usually best to have separate tests in verbal and written reports. Written reports may be accompanied by rough sketches which may be made by roughly enlarging a small scale map, any additional information required being added to the enlargement. The sketch or enlargement should contain sufficient information to enable the locality it represents to be identified on the ordinance survey or other map in use. Irrelevant information should be discouraged. No attempt should be made to draw these sketches to scale, but important distances should be noted on the sketch.

CHAPTER VI

FIGHTING IN CLOSE COUNTRY, WOODS, AND VILLAGES

FIGHTING IN CLOSE COUNTRY

Section 24.—Influence of Close Country Upon Tactics

1. **Close Country.**—Any tract of country in which view and movement are seriously restricted by woods, fences, or high crops is *close country*. In such areas the enclosures may be bounded in very different ways—for example, by simple wire fences which do not interfere with view, do not afford cover from fire, and are a considerable obstacle to movement; by dense hedges, which give cover from view but not from fire, and are difficult to surmount or by high banks, which afford complete cover from view and fire, and are not a serious obstacle to infantry. The influence of enclosed country upon tactical methods also changes with the season of the year, and is not the same in winter when trees and hedges are bare as it is in summer when they are in full leaf.

2. Generally speaking, in close country, owing to the limitation of the field of view and of fire, the employment of artillery is restricted; machine guns, on the other hand, are well adapted for supporting infantry closely. Close country favors delaying action, but not necessarily a protracted defence, for it is often possible for the attackers to work up to the defenders unseen. It hampers deployment both for attack and for counter-attack, and makes it more difficult to discover when and where to strike

an effective blow. An important characteristic of close country is loss of higher control, which calls for more initiative on the part of subordinates in order to ensure combination.

3. Troops fighting in close country are usually very sensitive as to their flanks, as they are unable to see what is going on. This fact affects the defence more than the attack, for there is danger that a defended line penetrated at one point may give way everywhere. Further it is particularly difficult in close country for the defenders to deliver local counter-attacks in the most effective direction, or to organize converging fire against captured localities.

Section 25.—The Attack in Close Country

1. **Advantages.**—Close country enables the attacker to approach his enemy with less loss than is usually experienced in more open ground, gives him facilities for screening his movements and allows him favorable opportunities for surprising his opponent. To reap these advantages the attacker must be accustomed to manœuvre in close country, and must realize and make careful preparation to overcome the difficulties likely to be met. A thorough reconnaissance is of more than usual importance.

2. **Deployment.**—Troops detailed for attack should not be deployed prematurely. In close country affording cover from view the advance may be carried out safely in close formation provided the service of protection is properly performed.

3. **Direction.**—It is rarely possible in close country to keep the objective in constant view. Special care is therefore necessary if the direction of the attack is to be preserved. Even when the objective is clearly visible at the beginning of an attack it is advisable to take precautions in case it may disappear from view. The desire to make the best use of cover or to pass an obstacle at the easiest place frequently causes infantry to lose direction. The

simplest method of maintaining direction is by guides, or in default of guides by compass. Before infantry advances to the attack in close country the bearing of the objective should be made known to all officers and non-commissioned officers in possession of compasses.

4. **Fire.**—Owing to the short range to which the firing line may be able to approach before fire is opened, it must be prepared to meet with strong opposition directly its position is discovered and must itself be ready to develop a considerable volume of fire at any moment.

5. **Reinforcements.**—It may at times be advisable to move supports and reserves forward in file rather than in lines, taking advantage of the concealment offered by hedges or banks for this purpose. It must be remembered, however, that hedges leading in the direction of the enemy may become a dangerous trap if enfiladed by hostile fire.

6. **Co-operation.**—In country which is intersected by small woods, high banks and hedges, troops in one field are often ignorant of what is happening to troops in adjoining fields. In these circumstances co-operation is a matter of difficulty, and can only be ensured by careful preparation. The most effective method of keeping touch when on the move is for the commander of troops in each field to detail men to follow along the boundaries of that field with a view to reporting the movements of neighboring troops and the development of the situation. These men may also be used as intermediaries in passing orders and messages, when the ordinary means of communication fail.

7. **Re-organization.**—The re-organization of units is specially important in close country. All commanders, however subordinate, must endeavor to minimize the difficulties of control by taking every opportunity to get men in hand.

Section 26.—The Defence in Close Country

1. **Difficulties.**—The chief difficulties of a protracted defence in close country have been described in Sec. 24.

These difficulties may to some extent be removed by clearing the foreground and by improving communications.

2. The difficulties of the defence depend very much on the nature of the country. When enclosed country is flat artillery has few opportunities, but when it is undulating, though the field of fire at close infantry ranges is often very limited, it is usually possible to make effective use of fire at longer distances. Enclosed country is also frequently provided with such a network of roads as to reduce considerably the difficulties of manœuvre.

3. **Preparation.**—Sufficient preparation to prevent the attacker from concealing the direction of his main attack more effectively than he could do in open country will however be rarely possible. It will be advantageous usually to throw forward a screen to force early deployment, this screen falling back gradually on to or round the main defensive position. This end can also be achieved by pushing forward small bodies of infantry along the roads open to the enemy. It will often be advisable to penetrate the enemy's screen by means of local counter-attacks in order to discover his plans and defeat the heads of his columns before they deploy. Such attacks, being specially intended to obtain information, may usually be delivered sooner than counter-attacks intended to repulse the enemy's firing line and to force him to use up his reserves.

4. **Commanding Positions.**—As a general rule commanding positions in enclosed country, unless they have exceptional advantages in the form of an increased field of fire, should be avoided. They serve as an easy objective to the enemy's infantry and artillery and obviate many of the difficulties which the attacker has to overcome.

WOOD AND VILLAGE FIGHTING

Section 27.—General Considerations

1. Woods and villages may be expected to exert a powerful influence over the movements of troops operating in

their immediate neighborhood. Not only are troops instinctively attracted towards them during an action, in search either of a covered approach or of some tangible object to attack or defend, but the fact of such places being named on a map increases the probability of fighting in their locality, in that they may be used to define the boundaries of sections of the attack or defence, or as points of direction for portions of the force. *An added importance attaches to villages from the facilities they afford for obtaining water, supplies, and shelter.*

2. In war it may be expected that woods will frequently be used to conceal movements from the observation of hostile aircraft, while in an extended battle front it may often occur that parts of the force will be compelled to operate in woods and villages, even though the remainder are fighting in the open. Woods and villages may also be used in front of a defensive position to command otherwise dead ground, to induce a premature deployment, or to break up an enemy's attack.

Section 28.—General Principles of Wood Fighting

1. The movements of large bodies of troops in a wood will be slow, and communications much hampered. Scouts must reconnoitre well ahead of the troops, and must advance by stages in the usual manner. When collision with the enemy is expected, small parallel columns, in fours or file, at deploying interval, will usually be the most convenient formation for an advance, and in order to reduce the mingling of units when fighting begins, the distribution of companies should be in depth rather than in breadth. Careful arrangements must be made for preserving lateral touch, and for guarding the flanks. The maintenance of direction will often be difficult, and it will usually be necessary to march on a compass bearing, the same precautions being taken as for a night advance.

2. **Fire.**—The action of artillery and of mounted troops will be greatly restricted, both in attack and defence, and

infantry must largely depend on its own efforts to attain success.

3. Fighting will, as a rule, take place only at close range, and both in attack and defence infantry should be ready to develop a strong fire at the outset, and to charge with the bayonet at the first opportunity.

4. **Reserves.**—All commanders must keep small reserves in hand to meet counter-attacks or unforeseen emergencies, and stragglers must be collected to form new reserves.

5. Higher control will be a matter of great difficulty, and much will depend on the maintenance of intercommunication and on the initiative and resource of subordinate leaders.

6. **Surprise.**—The curtailment of the danger zone will place the defence at an added disadvantage, but opportunities for surprise and for misleading the attacking force will frequently present themselves. Opportunities for counter-attack will also frequently occur, but the difficulty of seeing what is happening in the immediate neighborhood makes it of more than usual importance that counter-attacks should not be carried too far.

7. **The Bayonet.**—*In wood fighting generally, infantry who use the bayonet have the best chance of success.*

Section 29.—Attack on a Wood

1. **Phases.**—The attack on a wood will consist of one or more of the following three phases, each of which will as a rule be entirely different in character, namely:

(i) *The fight for the edge of the wood.*

(ii) *The struggle in the interior.*

and

(iii) *The debouching from the wood on the enemy's side.*

In the first the attacker will probably have artillery predominance; in the second the guns on both sides can do little to assist; while in the third the defender will usually have superiority in artillery fire. The attack on the edge of a wood differs in no way from the attack on any other position.

2. **Precautions.**—When once the edge has been gained, immediate steps must be taken to get the troops in hand and to guard against a possible counter-attack. Small parties must at the same time be sent forward to reconnoitre the wood and gain touch with the retreating enemy. Rides and clearings, especially those which run diagonally in the direction of the enemy, must be examined with particular care before troops emerge on them, as the opposite sides or ends may be held by the enemy, and the attacking force subjected to a heavy frontal or enfiladed fire.

3. Particular care must be taken to guard against counter-attacks during the advance through a wood, and to protect the flanks. If the wood forms part of an enemy's defensive line, communication must be established with the attacking troops on both flanks, in order to prevent the troops inside the wood from debouching too soon.

4. **Machine Guns.**—Machine guns may be employed usefully in the firing line in the interior of a wood, and it may also be possible to bring up small portions of artillery in close support.

5. **Obstacles.**—When available, detachments of engineers should accompany troops advancing through woods, in order to assist in the demolition of obstacles. If the enemy can open effective fire on the attackers as they issue from the wood, the outer edge of which may be prepared with abattis and entanglements, the advantage of covered approach will probably be overbalanced by the disadvantage of offering an easy target at a known range, and it may be better to seek another line of advance. If this is not possible, very careful arrangements must be made before attempting to debouch.

6. Gaps must be made in any obstacles that have been prepared; the troops must be deployed some little distance inside the wood; arrangements must be made for the strongest possible artillery support; and, if possible, the advance of the infantry should be simultaneous with the advance of the attacking troops on either flank of the wood. When all is

ready the infantry should press forward into the open in one rush until the danger zone at the edge of the wood is passed. On such occasions it will, in default of other cover, be better to halt in the open, well clear of the wood, than to pause in the neighborhood of its edge.

Section 30.—A Wood in the Defence

1. If a force is acting temporarily on the defensive, and the general line to be occupied includes a wood or woods, the question as to whether or not the line of defence should include the wood will depend on the configuration of the ground, the general disposition of the force, and the extent and nature of the wood itself.

2. Generally speaking, *if the wood is of small extent and can be outflanked, the most suitable position for the infantry will be in front of it.* If, on the other hand, the wood is large, and the configuration of the ground and general disposition of the force admit, it may be preferable to take up a position in rear, with the object of bringing a heavy artillery and infantry fire to bear on the enemy at close range when he attempts to emerge. When it is desired to make use of a wood *in front* of a defensive position with a view to breaking up an enemy's attack, it will usually be advantageous to hold the front of the wood.

3. In the case of a position being taken up *in rear* of a wood, it may sometimes be advisable to throw detachments forward into the wood itself with a view to harassing the enemy's advance, or if suitable clearings exist, to offer a stubborn resistance at such points. If time permits it may, in the absence of suitable clearings, even be advisable to clear portions of the wood for this purpose. Abattis and entanglements should be prepared both inside the wood and at its edge, and careful arrangements made for the withdrawal of the advanced troops well ahead of the enemy.

4. In holding the front face of a wood, though the wood itself may provide valuable cover for supports and reserves,

it is rarely advisable to hold its actual edge, which usually presents an easy target to the enemy's artillery. It is often possible by clearing undergrowth and the lower branches of trees to establish a firing line some distance inside the wood, or trenches may be sited well in front of it, covered communication with the supports or reserve inside being arranged.

When the front edge of a wood is held, and guns are used in close support, careful arrangements must be made beforehand for their rapid withdrawal to the rear in the case of necessity. Should the enemy succeed in entering the wood, counter-attacks must at once be delivered on the initiative of subordinate commanders, and every effort made to dislodge him at the point of the bayonet.

5. When it is for any reason desired to act on the defensive in a large wood, and the outer line is too extensive to be held by the troops available, the wood may be defended effectively from a position prepared in the interior. A short field of fire will then be sufficient to prevent the attacker, who cannot easily be supported by artillery fire, from leaving cover to continue his advance.

A position of this nature should be on some well-defined feature, such as a road, a ride or stream. It should be artificially strengthened by means of breastworks, abattis, etc., and the ground in front should be cleared as far as time permits. Guns and machine guns should be placed in position with the infantry, special arrangements being made for their prompt withdrawal in case of necessity.

Section 31.—Attack on a Village

1. It may be presumed that an enemy defending a village, whether in front of or forming part of his defensive line, will usually have prepared infantry trenches in front and to the flanks of the village itself. The conduct of the attack will in its initial stages, therefore, be similar to the attack on any other prepared position.

2. When, however, a village is obstinately defended by

the enemy, it may sometimes be advisable, during the later stages of an attack, to mask the village with the troops on its front while neighboring units press forward on both flanks, rather than to attempt its capture by assault.

3. **House-to-House Fighting.**—When the capture of a village is necessary before the units on either flank can advance, recourse to street or house-to-house fighting will sometimes be unavoidable. As soon as a footing has been gained on the outskirts of the village, the troops must be reorganized in preparation for a further advance, which should be directed simultaneously on to as many points as possible. The probability of vigorous counter-attacks at this period must not be overlooked. When once the interior of the village has been gained, the struggle will resolve itself into the individual efforts of groups of men; higher control will often be impossible, and subordinate leaders will influence the fight chiefly by their personal example. Every effort should, however, be made to maintain intercommunication, and this can usually be best achieved by sending back information to some prearranged point in rear.

4. All points gained, such as cross roads or important buildings, should at once be strengthened, so that attempts to recapture them may be defeated, and that they may serve as supporting points to a further advance.

5. When once the attacking troops have entered the village, their supporting artillery can be of little assistance, but it may be possible to bring single guns forward to destroy barricades, and generally to assist the advance. Machine guns will also be of great assistance at this time.

6. When the attacking troops are about to emerge from the cover of a village, the same precautions must be taken as described in Sec. 29, para. 6, the supporting guns covering the advance by engaging the hostile artillery.

Section 32.—Defence of a Village

1. When a village forms part of a general defensive line, the considerations which affect the question of its defence

will be similar to those discussed in Sec. 30, but the facilities it affords for water, cover, and shelter may usually be expected to point to the advisability of its inclusion in the main position.

2. **Garrison.**—In arranging for the defence of a village, whether it be isolated or in the main position, a definite garrison should always be allotted to it, and the defence of the whole village placed in the hands of one commander. The commander will divide the village into sub-commands as required, and will keep a reserve under his own hand.

3. It will usually be advisable to arrange for the garrison to be located, during the earlier stages of an attack, in trenches well to the front or on the flanks rather than in the actual buildings, which may be an easy mark for hostile artillery. If the configuration of the ground will admit, these trenches should be so arranged that a flanking fire can be brought to bear on the attacking troops as they approach, and guns may sometimes be posted in close support of the infantry, careful arrangements being made for their withdrawal in case of necessity.

4. **Defence.**—In preparing the interior of a village for defence houses should be loopholed, communications from house to house improved or improvised where required, and roads barricaded with a view to offering a stubborn resistance at close quarters.

5. **Fortifying Special Points.**—Special preparations should be made at important points, such as cross roads, village greens, or market squares, trenches and breastworks being arranged on the defender's side of these places, and it may sometimes be advisable to prepare a central "keep." Communication with the commander of the village and the various portions of the garrison will usually be best achieved by sending back messages to some central point in rear.

6. **Counter-Attack.**—Should the enemy succeed in entering the village, every effort must be made to dislodge him by means of counter-attacks delivered on the initiative of commanders of sub-sections of the defence. The flanks

will be specially liable to attack at this time, and special precautions must be taken for their protection.

7. **Retirement.**—In the event of the defenders being forced back to their positions in the interior the retirement should be covered by vigorous bayonet charges and by fire from the houses. Every effort must be made to keep the men in hand, and subordinate leaders must realize that their personal bearing at this time will have the greatest influence on the fight.

8. **Street Fighting.**—(i) *The Attack.*—In instructing troops in the principles of street fighting the comparative difficulties of shooting to the right or left from a window should be explained, together with the corollary as to which is the safer side of a street to remain on when advancing in face of the enemy.

(ii) It is obvious that a man firing from a window with his rifle at his right shoulder can shoot more easily, effectively, and with less exposure at persons coming up the street on his left, than at those coming from his right. If, therefore, it is possible to approach a single row of houses from the right of the defenders, this should be done.

(iii) If both sides of a street are defended, which will usually be the case when there are houses on both sides, the side opposite to that which has the fewer windows or fewer houses should be chosen for the advance. In the case of an ordinary village street devoid of barricades or other cover, defended by riflemen firing from the windows of houses on both sides of it, an advance up the street may sometimes be carried out in the following manner: Part of the attacking force will halt to the right or left of one end of the street, in a position with natural or constructed cover affording protection from the defenders' fire, from which they can command the windows on one or both sides of the street with oblique fire.

The rest of the attacking force will advance rapidly up both sides of the street, keeping close to the walls, supported by heavy covering fire from the rest of the force,

which should be effective owing to the fact that the defenders in the upper windows will have to expose themselves to fire down at the enemy below them in the street. In doing this they will also expose themselves to the fire of the attackers on the opposite side of the street.

(iv) No fixed rules can be laid down as to a streotyped form of attack in street fighting. The method adopted should be that best suited to circumstances, and will depend upon a variety of factors, such as the relative strength of the opposing forces, whether armored motor-cars carrying machine guns accompany the attacking force, the height and nature of the houses whether their walls line the street or are separated from it by gardens or areas, whether they are built together in a line or as separate premises with gaps between which the attacking force may use as approaches, whether or not the street is fortified by barricades or other obstructions, and whether fighting takes place by day or night. In every case, however, the struggle may be expected to resolve itself into the individual efforts of groups of men.

SIGNALLING

CHAPTER I

MESSAGES

Introduction.—This section of the Solano book on Signalling has been condensed, as the U. S. Army has its own system of signalling, and the elemental instruction is well taken care of by our manuals. The English method of instruction begins with indoor work where the flag drill, Morse code and semaphore are learned and then applied in the field. All of that is taught in the American Army. The British Army instruction then proceeds with the details of a system which may be found important.

Section 1.—Description of Message Form.

Herewith is given the British Army Form C 2121, used for messages and signals. It is divided into the following parts:

Preamble.	Address FROM.
Address To.	Space Z.
TEXT of Message.	Scale of quarter-inch squares on back for sketching.

Section 2.—Preamble

This consists of prefix, code, office of origin, service instructions, and number of words. It is reserved solely for the use of the signallers dealing with the message. Nothing is to be written by the addressor on that part of the form above the portion allotted to the "Address To."

Section 3.—Prefixes

1. These are signalled at the beginning of the message, except in the moving-station method, and serve the double purpose of giving precedence of despatch to the more important messages, and indicating to the signallers receiving a message whether it is to be transmitted on by them or delivered to the address from their own station. When the prefix contains the letter X the message will be sent on; if it contains the letter S it is for delivery.

2. **"Urgent Signal" and "Priority" Messages.**—Officers in charge of the signal arrangements are alone empowered to send "Signal Service messages requiring immediate attention." They should never do so except when it is absolutely necessary.

Signallers will be supplied with a list of officers entitled to send "Priority" messages.

Authority also will be deputed to certain officers to send "military railway service messages requiring immediate attention."

In sending these three types of messages the officer anthorizing them will write the words "Urgent Signal" or "Priority," as the case may be, in space Z, which must under all circumstances be signed according to the directions printed in it.

3. **Signing of Messages.**—Messages, other than "Urgent Signal" or "Priority," must be signed by one of the following officers.

i. A commander.
ii. An officer of the staff.
iii. The head or representative of an administrative service or department.
iv. An officer holding a special appointment.
v. The signaller in charge of a station ("S.G." or "X.G." **messages only).**
vi. In the case of "Press Messages" special instructions will be issued.

4. **Classification of Messages.**—All messages will be classed and prefixed under one of the following headings which are aranged in order of precedence. If a station has two messages to send away with different prefixes, it will signal them according to the above order of precedence irrespective of the order in which they were handed in. Thus the message which comes first in the order of class and prefix will be sent off first. For the order of sending messages with the same prefix, see Section 4, para. 6.

Messages to be delivered at Receiving Station.	Messages to be transmitted at Receiving Station.	Class	
DS	DX	Signal Service messages requiring immediate attention (to be marked *"Urgent Signal"*).	
SA	XA	Military railway service messages requiring immediate attention (marked *"Urgent Railway"*).	
SB	XB	Messages "O.H.M.S." marked *"Priority."*	
SG	XG	Signal Service messages.	
SM	XM	Messages "O.H.M.S." not marked *"Priority."*	
S	X	Private messages	Equal as regards precedence
SRP	XRP	Reply Paid Messages	
SP	XP	Press messages.	

5. **Interruption of Messages.**—A message in course of transmission will be interrupted in order to deal with one of a higher prefix. This applies to a message that is being received as well as to one being sent.

The procedure will be as follows:—

The station which has the important message sends "RQ," offers Prefix; on receiving the signal "G" sends the message; on receiving "RD" carries on with the interrupted message.

Section 4.—Code Time

1. In the space marked "Code" is shown the "code time," namely, the exact time the message has finally been accepted for transmission from the man who handed it in by the station called the office of origin, which starts it on its journey. This serves the purpose of showing how long a message has taken in passing through the hands of the signallers. It is also useful if a signaller wishes to refer to some previous message, which can be done by merely quoting its code time, for no two messages from the same station can be coded alike in regard to time.

2. **Signalling the Code Time.**—In order to save time in spelling out or sending the code time of a message in figures the following system is adopted. The twelve hours from one in the afternoon to midnight and from one in the morning to midday are denoted by the first twelve letters of the alphabet omitting J, thus:

A denotes 1.	E denotes 5.	I denotes 9.
B " 2.	F " 6.	K " 10.
C " 3.	G " 7.	L " 11.
D " 4.	H " 8.	M " 12.

These letters stand not only for the hours, but also for the twelve periods of five minutes. Thus A stands for one o'clock and for five minutes past any hour; B stands for two o'clock and for ten minutes past any hour; F stands for six o'clock and for thirty minutes past any hour. So that AA means 1.5; AB means 1.10; BF means 2.30; and so on. To denote the intermediate minutes in every period of five minutes, the letters R, S, W, X are employed, R denoting the first, S the second, W the third, and X the fourth

minute after any of the periods of five minutes. Thus MR means one minute past twelve; MS means 12.2; MW means 12.3; and MX means 12.4. So again MAR means 12.6; FFS means 6.32; and KLX means 10.59.

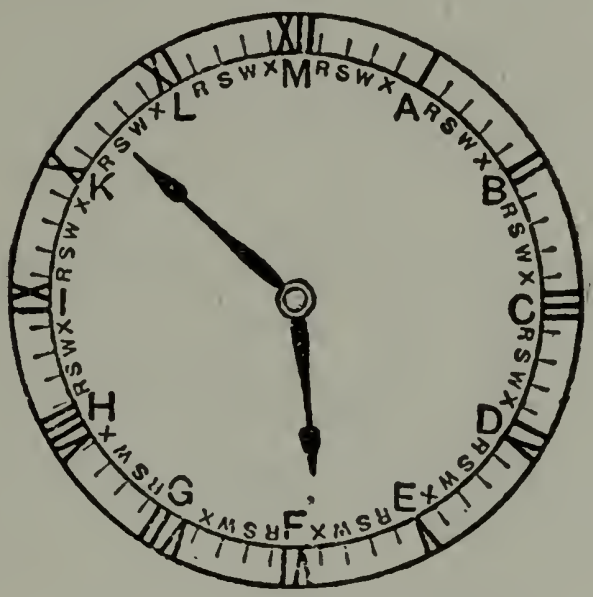


FIG. 1.—LETTER CLOCK.

Letter Clock.—Above is shown a sketch of an ordinary clock-face with the letters placed against the hours, the periods of five minutes, and the intermediate minutes which they denote. The hands of the clock show that the time is 5.52, and the letters which denote that time are EKS (Fig. 1).

3. The letters "am" and "pm" are always entered and sent in conjunction with the above. If messages are handed in exactly at noon or midnight they will be coded one minute later so as to avoid confusion. Thus a message handed in at midnight would be coded "MRam" and one at midday "MRpm."

4. The code time will be entered and signalled as above, but at the receiving terminal—the station where the message has to be delivered to the addressee—it will be entered in figures.

5. It will be acknowledged by repeating the letters sent.

6. When a station has two or more messages with the same prefixes waiting to be sent, it will send them in their proper turn according to the code time.

Section 5.—Office of Origin

The office of origin is the name of the station at which the message is handed in by the addressor or his representative. Only the call representing it is entered on the form signalled, but at the receiving terminal the name is written in full.

Section 6.—Service Instructions

Service instructions are used in the following circumstances; they are entered and signalled in full:—

(i) When a message has been unduly delayed the cause will be entered, thus, "Line dis."

(ii) When a message is redirected the words "Redirected from....." (and "date," if the date of redirection is different from the date of code) will be entered.

(iii) When a similarly worded message is to be delivered to more than one addressee, the number will be entered and the number for delivery and number for transmission stated, *e.g.*, "3 addresses, 2 S, 1 X."

(iv) When a message is not completed on the day to which the code time refers, the original date will be entered by the station first acknowledging receipt of the message on the following day; thus, if a message handed in and finally accepted at 11.55 p.m. on the 15th is delayed in starting for six or more minutes, the sending terminal would enter "Of fifteenth"; or again, if the same message although completed by the sending terminal before midnight had to pass through several transmitting stations and consequently arrived at the receiving terminal on the 16th, then the station who first acknowledged the correct receipt of the message on the 16th would enter "Of fifteenth."

(v) When a message *starts* on its journey by despatch rider, and is subsequently sent by signal, the station by which it is first signalled either visually or by telegraph, telephone, or wireless, will be considered the office of origin, and an entry will be made in the Service Instructions, "By despatch rider from (place)....."

(vi) "Priority" is entered in the case of all priority messages.

Section 7.—Words*

The whole sense of a message may be altered by the omission of one word. Consequently the portion of the preamble dealing with the number of words in a message will invariably be sent. The number of words counted in accordance with rules laid down will be entered in figures thus, "32," but will be signalled as "thirty-two" in one group and acknowledged by the *General Answer*.

Section 8.—"Sent" and "Received" Columns

1. These do not form part of the preamble, and the information entered in these spaces is not to be signalled; it affords, together with the preamble, a complete history of the message during transmission.

2. A message is said to be "sent" or "received" at the time when the sending station sends the acknowledgment "RD."

3. In the space "To....." will be entered the "call" of the stations to which the message is sent. Similarly at a Receiving Terminal in the Received Column, in the space "From"' you enter the "call" of the station you received the message from.

4. In the space "By ....." will be entered the rank, name, and initial of the sender and reader of the message.

5. Any of the above spaces which do not apply to a

* The space for *charge* next to that for words on the form is only for use by the Telegraph Department.

particular station will be left blank, but all stations must enter their own call and the date on the line "Date....." in the "Received" column. This is necessary to identify a form with the station which deals with it. This is usually referred to as the "office stamp."

6. **Example.**—The following example shows these spaces as completed by a Sending Terminal and a Receiving Terminal station respectively.

Sending Terminal:—First Brigade, call ZA, sender Corpl. W. White.

Receiving Terminal:—Cameron Highlanders, call CH, reader Pte. T. King.

The message was handed in at the First Brigade Signal Office at 10.40 a.m. The answer to "RD" was sent by AB at 10.58 a.m. Date May 2, 1914. The message was delivered to the Addressee in the Cameron Highlanders by an orderly.

FIRST BRIGADE.

No. of Message.

Sent.		Received at.....a.m.
At 10.58 a.m.:	.....	Date ZA / 2.5.14
To CH.		From .....
By Cpl. White, W.	.....	By .....

Section 9.—Number of Message

At each station all messages, whether sent, transmitted, or received, will be numbered consecutively in the space provided in the upper right-hand corner of the form. This number must not be signalled, but serves the purpose of connecting these entries with the form on which the message in question will be found.

Section 10.—Address TO and Address FROM

1. The addresses "To" and "From" will be signalled exactly as they are written by the addressor. They will always be entered, by signallers, in *BLOCK LETTERS*.

2. Should the addressor wish any instructions regarding the delivery of, or replies to, a message to be signalled, he will enter the same after the "Address To," but in the same portion of the form, thus:

West Yorks. Dover.
To await arrival.
or 1st Brigade.
ALTON (or forward).

3. After sending the number of "words" each word of the "Address To" will be signalled. This will be followed by any instructions there may be.

Section 11.—Break Signal

The Break signal, II, will then be signalled to separate the "Address To" from the "Text." It will not be entered on the form. It will be acknowledged by the General Answer.

The break signal will likewise be used after the last word of the "Text," to separate that portion of the message from the "Address From."

Section 12.—Text

1. Each word, etc., will be signalled so that it may appear on the addressee's copy of the message, as nearly as possible the same as the original, written and handed in by the addressor.

2. Any word which has been written in an abbreviated form by the addressor will be signalled as written and will be left on the addressee's copy as read at the receiving terminal. For example, lbs. for pounds, No. for number, ult. for ultimo, Nov. for November, etc.

3. The first line of the text is divided into four spaces marked respectively, "Senders Number," "Day of Month," "In reply to Number," and "AAA."

4. All officers should number their messages consecutively, no matter by what means they are conveyed. This number should be entered by the *addressor* in the space marked "Sender's Number."

5. When replying to a message, its number should always be entered in the space "In reply to Number." These numbers and the date will always be signalled and entered in their proper position, as written by the addressor.

6. The letters "AAA," as printed on the form, are signalled as a group of three letters to prevent any possibility of these preceding reference numbers being confused with numbers occurring at the commencement of the message itself.

7. Should these spaces not be required the whole line will be erased and the "AAA" will not be sent.

Section 13.—Space Z on the Message Form

1. Special instructions will generally be issued with regard to messages being signed by the "Censor" and "Franking Officer"; usually this would only be necessary in the case of Press and Private messages.

2. Space Z must always bear the signature of the addressor or that of the officer sending the message on his behalf. The signatures are not signalled, but are required so that the responsibility for the matter, etc., of a message can, if necessary, be traced to an individual.

Section 14.—Messages on Plain Paper.

If a message is handed in to a signal station written on paper other than on the form above described, the number of words will be entered above the "Address To." Should space not permit of this, the message will be attached to a blank form, and the number of words entered thereon; the Addresses "To" and "From" and the "Text" will not be copied on to the form. The original message must bear the signature of the addressor or person sending the message in his name and will always be retained.

Section 15.—Duplicate Copies at Receiving Terminal

Before the writer at a station begins to write down a message he inserts a piece of carbon paper. When the message is completed the top copy is retained for record and the bottom copy is eventually delivered to the addressee.

Section 16.—Delivery of Messages

1. A terminal working under a Brigade Signal Office or other unit will, on completion of a message, send both copies duly completed down to its Headquarters. There it will be dealt with as follows:—

The bottom copy will be placed in an envelope (A.F. C 398) on which the required particulars will be entered. The message will then be delivered by an orderly to the addressee or his representative, who will fill up and sign the receipt in the space provided on the envelope. The orderly will bring back the receipt, which will then be attached to the top copy on the file. If envelopes are not available, a receipt should be obtained either by means of a despatch book, or by having the top copy signed.

2. In the case of a station which is not working under a signal office or a Battalion or Regimental Headquarters the signaller in charge, after completing the message form and making the necessary entry in the Register, will place the top copy on his file and enclose the bottom copy in an envelope (A.F. C 398) on which the required particulars will be entered. *Remainder of procedure as in para.* 1 *above.*

ARMY FORM C398.
TO:—

Despatch.	Receipt.
Sender's No.	Date .....hour.....m.
Date .....hour.....m.	Signature:—
URGENT or ORDINARY.	.....

NOTES.—(i) The words "This envelope to be returned to bearer" are printed on the flap at the back.

Section 17.—Signal Register

(i) A Register for all outgoing messages will be kept at each Signal Office in the case of Brigades and at the Headquarters of all other units. Entries will be made in this Register as follows:—

Signal Register for Outgoing Messages.

Place..... Date.....

	Sender's No.	* Time of receipt in Signal Office.	Address to	Method of Despatch.	Despatch Rider.		Remarks.
					Name.	Time of Departure.	

* Only for use in Signal Units.

(ii) **Visual Messages.**—When the message has been completed and the message form filled in, it will be sent to the Headquarters of the unit (or Signal Office); there the necessary particulars will be entered up, and the letter S (meaning

by Signal) entered in the "Method of Despatch" column. The message will then be filed.

(iii) **Messages by Despatch Riders.**—All necessary particulars will be entered on the form before starting, with the letters D.R. in the "Method of Despatch" column.

(iv) **Telephone Messages.**—As in para. (ii) above, with the letter "T" meaning Telephone in the "Method of Despatch" column.

Section 18.—Disposal of Message Forms

Messages, with their Registers, will be made up into packets daily. Each packet will contain all messages dealt with from midnight to midnight. The forms should be packed flat, not rolled or folded. These packets will be forwarded periodically as directed by the Director of Army Signals. The wrappers covering the parcels of messages should show the name of the office from which they emanate, together with the inclusive dates to which they refer.

Section 19.—Message Entailing the Use of More Than One Form

When a message is so long that it cannot be entirely written on one form, it will be continued on the "Text" portion of a second and, if necessary, subsequent forms. The office stamp will be entered on each form, and the "Address From" will appear in its proper place on the last form used. The number of forms used will be clearly written at the top of the first form, *e.g.*, "Three Forms." Each sheet should be numbered, *e.g.*, 1st sheet, 2nd sheet. The particulars as to "sent" and "received" will be entered only on the first form.

CHAPTER II.

STATION WORK

Section 20.—Duties of the Signaller in Charge

In addition to their routine duties, signallers in charge of stations will pay attention to the following points:—

(i) Rigid discipline is to be enforced, and every point, however trifling it may seem, must be strictly carried out.

(ii) While work is actually going on, all unnecessary talking or moving about is strictly prohibited.

(iii) All attempts to attract the attention of a distant station are to be continuous until replied to.

(iv) All unauthorized persons are to be prevented from loitering within sight or hearing of the station, or in any way hindering the work thereat.

(v) When a station moves, it must inform all others with which it is in communication, prior to doing so, and indicate the direction in which it is going, and, if possible, the approximate point and time at which it will again call up.

(vi) Signallers must understand the confidential nature of their work, and that it is a serious military crime to disclose messages or their meaning without authority.

(vii) A diary should be kept by each permanent station, in which should be entered each day names of stations, columns, etc., with which communication has been opened, any casualties, state of weather, and other information which may prove of future service.

(viii) Signal officers must take steps to see that all stations in their charge are provided with copies of the following orders, which will be published from Army Headquarters:—

Order prohibiting unauthorized persons (officers or others) loitering in the vicinity of stations.

Order requiring all messages to be either written or dictated and to bear the signature of the addressor or his deputy.

Section 21.—Disposition of Signallers

It is impossible to lay down fixed rules on this subject, as the ground and circumstances in each case must be taken into consideration. As a general principle men should be as close together as possible without hindering or impeding one another. Signallers should be taught to at once arrange themselves in such a position with regard to one another that the work may be carried out with the utmost efficiency.

Section 22.—Terminal Stations

1. When the two places which have to be put into communication are visible to one another, and are within the range of the available apparatus, a Terminal Station at each point is all that is necessary. These stations are called *Sending* or *Receiving Terminals,* according to the direction of each message.

2. The full complement of signallers required for a terminal station is three men; this number should, if possible, be detailed when the binoculars have to be employed, in bad weather, and when there is a likelihood of much work. With well-trained men, and at distances not necessitating the use of the binoculars, two men should be found sufficient.

3. The signallers at a *sending terminal* will perform the following duties:—

"Caller" takes charge of the form and calls out each word or group of the message to

"Sender," who pays attention to the flags, discs, or lamp, and sends each word or group as ordered, but waits for

"Answer Reader," to report each words as being answered before he (*i.e.* the sender) proceeds to send the next.

4. Similarly at a *receiving terminal:*—
   "Reader" (with the binoculars) reads each letter, numeral or sign, saying "group" on the conclusion of each word, etc., to
   "Writer," who writes each word, group of numerals, numeral or sign which forms part of the message as read, on a form, and if satisfied with each word or group orders.
   "Answerer" (with flags, disc, or lamp) to send the answer or any check letters or other signs as required.

5. When less than three men are employed some of the above duties must be combined as may be found most convenient. For example, at short distance a sender or caller can read answers in addition to his own duties, or again at a receiving station the duties of reader and answerer may be combined provided the binoculars are not being used.

Section 23.—Detailing Signallers to Stations

1. The general principle to be borne in mind when detailing signallers is that as few men as possible should be employed consistently with the work being carried on efficiently and without loss of time. Generally speaking it is inadvisable to detail less than two men for terminal station.

2. The non-commissioned officer or signaller in charge of the station will generally perform the duty of caller or writer.

3. In the above the question of reliefs has not been taken into consideration. The number of men available, the number of stations to be maintained and the probable amount of work must be considered in determining how and when these can best be effected.

Section 24.—Duties at a Sending Terminal

1. **The Caller.**—(i) He will take charge of all messages waiting to be sent.

"A" Form. Army Form C 2121.

MESSAGES AND SIGNALS.

No. of Message———

Prefix..... Code..... m.	Words.	Charge.		
Office of Origin and Service Instructions.			*This message is on a/c of:*	Recd. at..m.
.....	Sent		..... *Service*	Date.....
.....	At.....m.			From.....
.....	To.....		.....	
.....	By.....		(Signature of "Franking Officer.")	By.....

To				

Sender's Number.	Day of Month.	In reply to Number.	AAA

From				
Place				
Time				

The above may be forwarded as now corrected.

.....

Censor.

(Z)

.....

Signature of Addressor or person authorised to telegraph in his name.

(ii) He will superintend generally the sending of a message.

(iii) He will dictate each word or group to the sender. As soon as the sender approaches the end of a word (generally on the second or third letter from the end), he will call out the next word in its entirety; long words and proper names should also be spelt out, as well as any which, though alike or similar in pronunciation, can be spelt in several ways, *e.g.*, "to," "two," and "too." When a group is to be acknowledged otherwise than by the general answer he will not call out the following one until the correct check letters have been received.

(iv) He will repeat or spell out any group about which the sender may be in doubt and which the latter will indicate by saying "after——" or "spell" respectively.

(v) To assist himself to keep his place he may make a mark against each word directly the acknowledgment to it has been received.

(vi) When he has given out a group which has to be checked back, he will check the letters as called out by the answer reader with the message. He will not inform the latter of the check letters he may expect.

(vii) He will recount the message as soon as he has ordered VE (meaning "end of message") to be sent.

(viii) Having ordered RD to be answered by the general answer, he will complete the sent column and fill in the call and date in the proper space.

(ix) In messages containing more than fifty words he will make a distinct mark after every fifty.

2. **The Sender.**—(i) He will pay attention to his flags, disc, or lamp and not to the distant station, and make his signals distinctly and in regular time; if he is not read the fault probably lies with himself.

(ii) He will send each word or group as ordered by the caller. If a group is not answered (indicated by the answer reader remaining silent) he will, after a reasonable pause, repeat the group without any further order from the caller.

(iii) If he is in doubt regarding any word he will say to the caller "after —— (last word he has sent)," or if he wishes a word spelt out to him he will say "spell."

3. **The Answer Reader.**—(i) He will keep his attention constantly on the distant station.

(ii) On seeing the answer made, he will call out "answered," so that the sender may hear him and understand that he can proceed to send the next word.

(iii) He will at once report all signals made by the distant station and will read all check letters as sent, to the caller, so that the latter may compare the same with the Form.

Section 25.—Duties at a Receiving Terminal

1. **The Reader.**—(i) He will keep his eye constantly on the distant station.

(ii) He will read each signal or letter as he sees it and not the words in their entirety.

(iii) Directly he sees the flags brought into the body, or the disc or lamp obscured, he will say "group" to indicate the conclusion of the word to the writer.

(iv) He will on no account take on himself the duty of the writer by ordering the answerer to answer a group, as, although it may be correctly read, omissions and errors are almost certain to result therefrom.

(v) He will not make any remarks regarding the words or message while reading.

(vi) He will not take his attention off the distant station until he is relieved.

2. **The Writer.**—(i) He will enter the message on the message form, taking a duplicate carbon copy, each part in its proper place in a clear running hand (excepting those portions in "block"). Groups consisting of single letters, although not preceded by the "block" sign, should be entered in block letters.

(ii) On hearing "group" from the reader he will understand that the word or group is concluded, and will, if

satisfied as to its correctness, order the answerer to answer by saying "yes" (indicating the general answer), or giving the check letters as the case may be.

(iii) If not satisfied with a group he will make no remark; it will then be repeated by the sending station; should the same group be repeated three times alike it should be accepted and answered.

(iv) In DD, DD messages he will enter each word on the form with its repetition below it, and on conclusion of the message will re-write it in the ordinary way.

(v) He should note on a separate piece of paper, from time to time, the total number of words received, so that on conclusion of the message he knows at once whether the total number agrees with that signalled in the preamble. In case of messages containing more than fifty words this rule must be carefully observed. These numbers must not appear on the addressee's copy.

(vi) On hearing the reader say VE he will, if satisfied that the message has been correctly received in every particular, order the answerer to send RD. He will similarly order the same acknowledgment to be sent when satisfied that a portion of a message containing more than fifty words has been correctly received.

(vii) If he is not satisfied, he will order "flag up," "light up," or "disc up," on which the answerer will bring the flag to the letter "E"; the writer will then look through the message and order the answerer to send the necessary signals asking for any corrections required. When all corrections are obtained and he is satisfied with the message he will order RD to be sent.

(viii) He will fill in the received column, entering the time as soon as the answer to RD is received.

(ix) He is responsible generally for the receiving of the message.

3. **The Answerer.**—(i) He is directly under the orders of the writer and will at once comply with all instructions from the latter to answer or send check letters or other signals.

(ii) He will wait at the "Ready" for orders from the writer.

(iii) He will on no account send an answer without getting the order to do so from the writer.

Section 26.—Succession of Duties

1. In the foregoing part of this chapter the duties, etc., have been laid down so as to show clearly upon whom the responsibility for every act in the sending or receiving of a message devolves; but as a rule, some of the duties would necessarily be combined, and it would only be at large or important stations that the signaller in charge would not as a matter of course perform one of these duties. It is most necessary, however, that all signallers should thoroughly understand their respective responsibilities, and that it is only by each man giving his whole attention to his own work and not taking upon himself other duties that real efficiency can be looked for. At the same time there must be co-operation, not only within a station, but between a station and those in communication with it. It will generally be found that speed and accuracy go hand in hand, and that speed, although dependent on the actual rate of sending and the capabilities of the readers, also depends very largely upon no time being lost between a duty and the one following it, no matter whether the duties are combined or each performed by a separate signaller. Thus:—

2. *At a sending station between:—*

i. The caller spelling out the word to the sender, so that there will be no delay in his sending it on directly "Answered" has been given by the answer reader.

ii. The sender hearing the word "Answered" from the answer reader, and beginning to send the next word.

iii. The answer reader seeing the answer given by the distant station and saying "Answered" to the sender.

3. *At a receiving station between:—*

i. The reader seeing the flag lowered, or the light or disc obscured, at the distant station at the completion of word or group, and saying "Group."
ii. The writer hearing the word "Group" given by the reader and saying "Yes" if it is correct.
iii. The answerer hearing the order "Yes" given by the writer and complying with it.

Section 27.—Station Calls

1. To enable one station to attract the attention of any other for which it may have a message, all stations will be allotted a distinguishing call, consisting of two letters, or three in exceptional cases.

2. For fixed stations these should indicate as far as possible the names of places occupied; thus the signalling station Newcastle might be given the call NC, or that at Britstown the call BT.

3. Similarly all parties of signallers attached to or accompanying the various staffs, departments, patrols, outposts, etc., should be allotted calls which as far as possible indicate the same, thus:

Signallers at General Headquarters, HQ.
Signallers at Army Headquarters, 1st Army, AHQ.
Signallers at Army Headquarters, 2nd Army, BHQ.
Signallers with Staff of 1st Division, AD.
Signallers with Staff of 2nd Division, BD.
Signallers with Right, Centre, and Left Patrols, RP, CP, LP.
Signallers with G.O.C. Royal Artillery, RA.
Signallers with a line of pickets, PA PB, PC.
Regimental Signallers Royal Scots, RS.

4. In allotting these calls, care should be taken that none are used which can lead to any confusion; thus the town of Reading should not be given RD for its call, this signal being used to intimate that a message has been correctly read.

5. These calls should be allotted by the signalling officer in charge. They should be made known to all concerned, and should be changed as seldom as possible.

Section 28.—Calling Up

Preparative Signal.—If a station wishes to communicate with another the name and call of which are unknown, it calls up with a succession of dots (Morse system) called the *Preparative Signal* until this signal is acknowledged by the General Answer from the unknown station, when the original station will send RU, meaning "Who are you?" This will be acknowledged by the General Answer from the unknown station, which will then send its name and call. If the original station knows the call of a distant station and is not already in communication with it, it will send the call of the station required, repeating it as often as necessary.

Example of Reply.—As soon as a distant station perceives that it is being called it will answer by sending its own call once. Thus, if Dover, the call of which is DV, wants to communicate with Canterbury, the call of which is CR, Dover will send CR. CR. CR. As soon as Canterbury notes this, if ready to receive the message, it will send CR, "G," which means that DOVER can at once proceed with the message. If not ready to receive it Canterbury will send CR, "MQ," which means "Wait a bit, we are not quite ready"; in the latter case CANTERBURY will send G when ready. Once communication has been established, further calling up should be unnecessary and is generally waste of time due to inattention.

Section 29.—Station Signals

1. **List of Signals.**—To assist in the smooth working of stations the following signals should be used when necessary. They must be complied with at once whenever possible, and will each be signalled in one group. They will

be sent without any preliminary signal with the exception of the signal KQ (Are you ready?) and PP (stop) when they are sent in the middle of a message (Section 33). These signals are made on the assumption that the stations are facing one another, and refer to three distinct purposes and miscellaneous matters as follows:

Instruction.	Signal.	How Answered.	Remarks.
(a) To move the Signaller at the Distant Station Short Distances.			
A. 1. Move to your right.	R	By the General Answer, then moving very slowly in the required direction (the flag being carried at the *Preparative*), at the same time watching the distant station, and halting at once on seeing it make a *dash* or obscure its light.	As soon as the station sending the signal sees the answer, it will hold the flag at the *Preparative* or keep the light exposed and watch the distant signaller moving: as soon as he reaches the desired position a *dash* will be made or the light obscured. If the lamp is being used it will be moved a short distance and reset, but in these cases time would probably be saved by sending fuller instructions. These signals are only used to move stations short distances.
2. Move to your left.	L		
3. Move higher up or farther off.	H		
4. Move lower down or clos in.	O		
(b) Regarding Flags.			
B. 5. Separate flags	SF	By the General Answer, then moving and halting as above.	Used when the waves of the distant station's flag cut those of another flag close to it, thus making it difficult to discern
6. Use blue flag	BF	By the General Answer, then complying with the order.	
7. Use white flag	WF		

Instruction.	Signal.	How Answered.	Remarks.
		(*c*) *Regarding Lamps and Heliographs.*	
C. 8. Open light	OL	By the General Answer, then keeping the light steadily exposed or, in the absence of sun, holding the flag at the *Ready*. When the distant light is satisfactory the station will obscure its light or make a *dash* meaning "Your light correct."	Used when a station wants a mark on which to set its light accurately. This may be necessary (*a*) because the lamp or heliograph has been moved accidentally; (*b*) when changing from sighting vane to duplex, or *vice versa;* (*c*) owing to being continually called for light, and it is therefore advisable to realign the instrument.
9. Calling for light. When the distant station's light becomes too bad or indistinct to be read with ease, it will be called for light by a succession of dots followed by a steady exposure of light or the flag held at the *Ready;* on seeing this signal it will at once expose its own light and slowly traverse the lamp or adjust the shadow spot of the heliograph until the station making the demand obscures its light, intimating that it is satisfied; the direction of the lamp or position of the shadow spot will at once be noted, and care taken that these are not altered. If the call is maintained the alignment of the heliograph or state of the lime pencil, wick, etc., should be looked to. The sender should give all his attention to his lamp or heliograph, while the answer reader must keep his eye on the distant station so that directly the light is obscured he can intimate the same to the sender by at once saying ***Down.***			The frequent use of this signal can only be necessitated (*a*) by a faulty heliograph or lamp; (*b*) by the sender not paying attention to his sighting vane or lime pencil, wick, etc. With young signallers there is a tendency to respond to a call for light by making a similar demand upon the distant station; this habit should be checked, and they will be instructed to rectify their own light first, and then, if necessary, they may demand a better light from the distant station.

Instruction.	Signal.	How Answered.	Remarks.
		(*d*) *Miscellaneous.*	
D. 10. Who are you?	RU	By the General Answer, then sending their call and name.	After acknowledging these signals the station which sent RU will send their own name and call. If there is likely to be any doubt as to whether a party of signallers are friendly or hostile, a prearranged signal should be used in addition to the call.
D. 11. Wait	MQ	By the General Answer.	Used for a temporary delay.
12. Are you ready?	KQ	By the General Answer.	This is only to be used when there is reason to suppose the distant station is *not* ready.
13. Go on	G	By the General Answer, then complying.	Sent by a station which has been called up and is ready to commence work or which has received KQ or sent MQ or stop signal (except when checking the words in a long message in multiples of 50) directly they are ready to resume work.

Instruction.	Signal.	How Answered.	Remarks.
D. 14. No answer expected.	*DD.DD	The receiving station will acknowledge the receipt of the message or resume answering as soon as it is convenient or possible to do so. The signal itself will not be answered.	Used when the receiving station is unable to answer owing (*a*) to the enemy being in the vicinity and the position being thereby disclosed or signals read; (*b*) to a likelihood of the sun being clouded, or gas, oil, etc., running short; (*c*) to the station being short-handed, or if for any other reason it is found advantageous not to send answers. The sending station will send each word, group, etc., twice, so as to increase the chance of its being read.
15. Send DD, DD messages.	NA		
16. No more messages coming at present.	NN	By the General Answer, and then complying. By the General Answer.	See remarks on 14.
17. Come in and check.	CI	By RD and complying.	This signal is used only for instructional purposes.

18. Should it be necessary to send instructions which cannot be conveyed by the above signals, and which may not be of sufficient importance to require an SG message (involving the keeping of a record), a private message will be sent (Section 52, para. 1 (iii)), without preamble or addresses.

* Sent in one group with a slight pause between the 2nd and 3rd D.

Section 30.—Receiving the Message from the Addressor

1. When a message to be signalled is handed in to a station the signaller receiving it will at once read it through and satisfy himself that all the words and figures in it are quite clear. Should he be in doubt regarding any word, etc., he will ask the addressor to make it clear, and to rewrite it if necessary. Likewise, should he notice any portion of the message which if written in a different manner would materially expedite or facilitate the signalling of the message, he will point it out to the addressor and request him to alter it, provided that course is agreeable to him.

2. The signaller will satisfy himself that the message is correctly signed in every case in space Z and in other spaces when necessary.

3. Should the addressor wish to dictate his message the signaller will write it down and hand the form to the addressor to be read over by him and signed as a guarantee that he is satisfied as to its correctness.

4. When a message is brought to a station by an orderly and any correction as above is thought desirable, the signaller in charge of the station will use his discretion as to whether the message should be sent back to the addressor for the same to be made, or whether it should be retained for transmission. He should never alter or pencil over any part of the message, but where words are obviously misspelt and in similar cases he may rewrite them at the foot of the message form for the information of the caller, whose attention should be drawn to them.

5. Should any question afterwards arise as to the genuineness, correct signalling, or delay of a message the signed copy will be the voucher of the signaller in charge of the station, and consequently signallers who accept messages for despatch without attending to the above points incur grave responsibility.

6. When the signaller is satisfied on the above points, he will, as a rule, at once fill in the number of words, but when the signalling of the message can be at once proceeded with,

or the message is exceptionally long, this latter may be filled in later by the caller, in which case the number of words will be signalled immediately after VE has been sent.

7. The form will then be handed over to the caller of the party working with the required distant station. He will arrange it with any other messages he may have in their order of despatch.

8. There should be no delay between the receipt of a message from the addressor and its despatch, and when, as is frequently the case, the caller himself takes over the message and there are no others having precedence over it, he will at once direct the sender to call up the distant station if not already in communication with it.

9. The addressors of Private and Press messages should be informed if there is likely to be delay in forwarding the same. If they cannot be dealt with on the day they are tendered for transmission, they should not be accepted.

Section 31.—Alterations to Messages

1. Under no circumstances whatever must a signaller make any alteration or addition to a message as handed in to him for transmission. Every word, sign, and group must be sent exactly as written by the addressor.

2. **Exceptions to Rule.**—The following are the only exceptions to this rule:

(i) If the names of towns and villages such as Newcastle-on-Tyne are not hyphened by the addressor the signaller will fill them in.

(ii) If the prefix St. is part of a name it must be joined to it by a hyphen, which must be added to the message by the signaller if omitted.

Section 32.—The Erase Signal

1. Should a mistake be made at the sending station either by the caller giving out a wrong word, group, or sign, or by

the sender inadvertently making a mistake, it will, if noticed, be rectified as follows:—

The sender either on his own initiative or by order of the caller will send the "erase" signal, *i.e.*, the opposite to "L," until answered by itself. At the receiving station the reader will notify it to the writer by saying "erase." The writer will then draw his pencil through the last word or portion of a word and say "erased," this being an order to the answerer to make the "erase" signal as an answer to itself, on seeing which, the answer reader at the sending station will say "erased," and thereby indicate to the sender that he is to stop sending the erase and repeat the word or group in which the mistake occurred.

2. Should a caller at a sending station find that check letters as read by the answer reader do not agree with the corresponding figures or letters on the form, he will at once say "erase," upon which the sender will send the erase signal which will be answered as above, and when answered the group will be sent again by the sender.

3. A receiving station sending a group of check letters or any other word or signal should, when necessary, use the erase signal as described for a sending station in para. 1.

4. Should the receiving station ask for the "word before" or "word after" a word which is not in the original message, the sending station will send the "erase" signal, meaning "there is no such word in the message."

Section 33.—The Stop Signal (PP)

This signal is used by any station to interrupt a message, and is only to be employed when absolutely necessary. It must be at once complied with. It is answered by the stop signal.

1. It is used in the following cases:—

i. During a message to send one of the station signals mentioned in Section 29.

ii. During a message to check the first 50, 100, or more words (see Section 39).

iii. At any time to send any instructions, as a signaller's message when this is unavoidable (see Section 46).

2. The station that sends the stop signal is responsible for resuming work on the interrupted message, as soon as possible, and will notify that it is about to do so by sending "G," except as in (ii) above. This will be acknowledged by the general answer, and the sending station will then continue the former message, commencing by repeating the last word that was acknowledged before the interruption. At the receiving station this will not be written down, but will be checked with the form and answered. Should there be any discrepancy the message will be continued in the ordinary way, and any corrections or repetitions required will be asked for on its conclusion, as explained below.

Section 34.—Method of Checking Messages

The writer will satisfy himself in every case that the total number of words received agrees with that signalled in the preamble, and in messages other than cipher he should satisfy himself as far as possible that the message is intelligible.

Section 35.—Number of Words Incorrect

1. Should the writer find that the number of words do not agree he will order the answerer to send the number of words in the message as received by him; suppose this to be "fifteen" and the number signalled in the first instance "sixteen"; the sending station on reading "fifteen" will acknowledge it with the general answer, and the caller, who by this time should have re-counted the message, should now know which number is correct; should it be fifteen he will order the sender to send [fifteen], meaning "fifteen correct, my error," which will be acknowledged by the general answer. The receiving station if the message is correct in other respects will then send "RD," which will be acknowledged by the general answer and the writer will alter the "16" in the preamble to "15."

2. But if the caller on re-counting is satisfied that sixteen is correct he will at once begin calling out to the sender the first letter or figure of every word or group (or portion of a group) that counts as a word (except the signal AAA which is sent in full). The receiving station will check these with their form, and if correct will answer each with the general answer.

3. When the receiving station read an initial letter or figure which does not agree with the group on their form, the writer will say "G," and this will be signalled by the answerer; it will signify to the sending station that they are to send in its entirety the group of which the letter or figure last signalled is the initial, or of which it forms a part.

4. Groups thus signalled in full will be answered as follows:—

i. Groups which would usually be answered by the general answer will, when repeated in full, be answered by the general answer, unless the receiving station wishes the following group to be signalled in full. In this case the receiving station will send "G" instead of the general answer and the sending station will signal that group in full. As long as the receiving station wishes the groups to be sent in full they will answer each group by "G." As soon as they answer a group by the general answer, the sending station will revert to initials.

ii. Groups which would usually be answered by check letters are, when repeated in full, answered by check letters. If these are correct the sending station at once sends the next initial letter or figure.

5. In thus checking a message the break signal, alphabetical and numerical signs, Z, CC, and VE, will be signalled in their proper places and answered, although they do not count as words.

6. Signs which count as a word will be signalled in full, *e.g.*, oblique stroke when used with letters, AAA, etc. A sign which counts as a figure will only be signalled if it

happens to come as the first figure of that part of a group which counts as a word, it will then be signalled in full: for example, in checking "31415.9" [3] and [AAA] are sent; in checking "23/12/09," [2] and [LT] are sent; in checking "23rd," [2] is sent; and in checking "1231st," [1] and [T] are sent. These figures, and signs counting as figures, will be answered in checking by the general answer. The numerical and alphabetical signs will be sent and answered in their proper places.

7. By the above means omissions can be discovered and entered in their proper places.

Section 36.—Doubtful Words; "WA" and "WB"

1. Should the writer be in doubt regarding any word or group he should ask the sending station (after VE or "stop signal," "fifty," etc., has been sent) to repeat it, employing for this purpose the signal "WA" ("word after") or "WB" ("word before"). The procedure will best be understood from the following example:—

Portion of Correct Message.

" . . . . attack fort by storm to-morrow . . ."

Message as Received.

" . . . . attack fore by strong to-morrow . . ."

i. { Receiving station sends [WA].
{ Sending station sends the general answer.

ii. { Receiving station sends [by].
{ Sending station sends the general answer. N.B.—In the event of the word not occurring in the correct message, the sending station will send the "erase," which the receiving station will answer by the "erase" and then proceed to obtain the correction by using some other word in the message and working backwards or forwards as below.

Sending station sends [storm].

Receiving station (*a*) sends the general answer, or (*b*) sends [G].

Sending station (*a*) remains steady, (*b*) spells out the *following* word in full, viz.:—[to-morrow]. (If "WB" had been used the *preceding* word would have been sent, and so on, working backwards.)

Similarly the word "fore" would be corrected by using "WB" in conjunction with the word "by" or "WA" in conjunction with "attack"; but in deciding which signal to use, the shortest word should always be chosen provided it leads to no ambiguity. Thus, in the above example, to obtain the word "storm," "WA" and "by" is used in preference to "WB" and "to-morrow," but if the word "by" occurred in some other portion of the message and "to-morrow" did not, then the latter would be used. For the above reason these signals will not be used in conjunction with the "break."

2. In the event of a word or two being entirely omitted (as would be seen by the number of words being wrong) and it being quite clear from the context of the message at what point they were omitted, the writer may ask for them in the above manner, but when there is any doubt the method of checking by initials should be used as being generally quicker in the end.

Section 37.—Repeat Signal, "IMI"

Should any particular portion of a message be found incorrect or incomplete, the receiving station (after VE or "stop signal," "fifty," etc., has been sent), will ask for that portion to be sent over again, which will be done in exactly the same manner as when originally sent. For this purpose the "repeat signal" [IMI] sent as a group of three letters will be employed. It will be acknowledged by the general answer, upon seeing which the receiving station will signify which part they require by signalling one of the following:—

i. Words.

ii. To (meaning "Address To including 1st break").
iii. Text (including 2nd break).
iv. From (meaning "Address FROM including VE").
v. [After] [. . . .] (meaning "send the message over again from . . . . (such and such a word), as from there it is unintelligible").
vi. All (meaning "send the whole message over again, as received by us it is unintelligible").

Whichever of the above are sent, the sending station will acknowledge it with the general answer and then comply with the request.

If, during the correction of a message, the receiving station wishes the sending station to remain steady, either because they think all corrections have been obtained or because they wish to ask for corrections at some other point of the message, the writer will order "flag up," and as soon as the writer is satisfied that the message is correct he will order "RD" to be sent.

Section 38.—Corrections by the Sending Station

1. A sending station can intimate that they are about to supply a portion or part of a message which has either been omitted or incorrectly sent, by alluding to it in the same manner as a receiving station (omitting the signal "IMI"). Should a station, while sending a message, notice that a word in some previous part of the message has been omitted or sent incorrectly, the message will be continued to the end in the ordinary way, and after VE has been sent the omission should be supplied by means of the signals "WA" or "WB." Thus:—

Portion of Correct Message.
". . . . attack fort by storm to-morrow . . ."
Message as sent and received.
". . . . attack by storm to-morrow . . . . ."

After VE.

i. { Sending station sends [WA].
{ Receiving station answers [General answer].

ii. { Sending station sends [attack].
{ Receiving station answers [General answer].

iii. { Sending station sends [fort].
{ Receiving station answers [General answer]. N.B. —Should the previous word, *i.e.*, "attack," not appear on the form at the receiving station, they will nevertheless note it marginally and on "fort" being sent will send "G" instead of the general answer, on which the sending station will spell out the next word in full and so on; by this means the proper place for the omission should be found.

2. Similarly, should the caller, on recounting the message after "VE," find that the number of words previously signalled is incorrect and if the receiving station has not already challenged his counting (by signalling the number of words as received by them) he will order the correct number to be sent as though none had been previously signalled.

Section 39.—Checking Messages Containing More Than Fifty Words

1. The message will be checked after every fifty words; after the sending station has received the answer to the fiftieth word they will interrupt the message by the "Stop Signal" and as soon as this is answered they will send [fifty], this will be acknowledged by the general answer followed by "flag up"; as soon as the receiving station are satisfied with these fifty words (having asked for any corrections as required) they will send "RD," which the sending station will answer and then proceed at once with the message. Similarly at the end of the next fifty words the sending station will interrupt the message and send [hundred] and so on.

2. At the receiving station the writer will either use a separate form for each fifty words or else make a distinct mark after each fifty words. He will not enter the word "fifty," etc., on the form.

3. This is the only case in which the letter G will not be sent, after sending the stop signal, before continuing the message.

Section 40.—Messages Delivered "Subject to Correction"

The delivery of messages the contents of which are obviously of an urgent nature should not be delayed in order to obtain corrections. The writer will write "Subject to correction" across the bottom copy and send it out for delivery. When the message has been corrected a fresh bottom copy will be written out for delivery and marked "Corrected copy."

Section 41.—Example of the Method of Checking a Message by Initials

If, taking the example given in Section 47, the Guildford station has only got thirty-one words instead of thirty-two, the following procedure will be followed to check the message by initials. After getting VE, the signaller in charge orders "Flag up" and recounts his message. He then orders "Thirty-one" to be sent to WOKING. The signaller in charge at WOKING orders this to be answered and then, recounting his message, finds thirty-two is correct and so at once proceeds to check as follows (Section 35):

W'oking sends.	Guildford replies.
I	General Answer
LT	" "
C	" "
T	" "
G	" "
II	" "
A	" "
Numerical sign	" "
5	" "
Alphabetical sign	" "
F	" "
B	" "
Numerical sign	" "
2	" "
Alphabetical sign	" "
AAA	" "
C	" "
M	" "
Z	" "
D	" "
NV	" "
W	" "
Z	" "
A	" "
Z	" "
G	" "
Z	" "
Numerical sign	" "
9	" "
Alphabetical sign	" "
A	" "
C	" "
W	" "

Woking sends.	Guildford replies.
Numerical sign	General Answer
I	" "
O	G (having only 15,000 he wants this group again)
150000	AEKKKK
Alphabetical sign	General Answer (at this point, having found his error, Guildford would at once send RD unless he had any other doubts)
R	General Answer
A	" "
II	" "
H	" "
Numerical sign	" "
I	" "
Alphabetical sign	" "
D	" "
B	" "
Numerical sign	" "
8	" "
Alphabetical sign	" "
A	" "
VE	RD
A	

Section 42.—Multiple Addresses

Messages with several addresses will be dealt with as follows:—

(i) When all the addresses are in the vicinity of the same station, only one form at the sending terminal is required. The number of carbon copies taken by the

receiving terminal will correspond with the numbers of addresses. On each of these carbon copies all the addresses will appear, but, before the forms are placed in their envelopes, a pencil line will be drawn through all the addresses except one on each form.

(ii) When all the addresses are at stations on different lines, a form will be required for each.

Section 43.—Redirected and Undelivered Messages

1. **Redirected Messages.**—Should it be impossible to deliver a message owing to the addressee having left the neighborhood, application should be made to the local commander or nearest staff officer for information which will enable the message to be redirected. The new address will be written on the form after the original address, which will be crossed out, and the message will then be despatched to its new address.

2. **Undelivered Messages.**—Should it be impossible to either deliver or redirect a message, a message should be sent to the office of origin (*not* to the addressor) stating reason for inability to deliver. The office of origin then becomes responsible that the addressor is informed that his message has not been delivered.

Section 44.—Inquiries Regarding Messages

When it is necessary to refer to a message that has already been dealt with, it may be described by giving in the following order as briefly as possible; the name of the addressor, the name of the addressee, and the date (if previous to that on which the inquiry is being made). Thus, supposing a message handed in by "Bde. Maj. 8th Inf. Bde. DEVONPORT" for "Royal Fusiliers, WEYMOUTH" on the 25th of the month is referred to on the 26th; it might be described as "[Message] [Bde.] [Maj.] [to] [R. Fus.] [twenty-fifth]."

Section 45.—The Obliterator Signal

1. This is used to cancel a message which is actually being sent. It will be made by sending "WW" as a group of two letters (after sending the stop signal) and will be answered by the same signal. The portion of a message to which it refers will be retained, and the word "Cancelled" written conspicuously across it.

2. In the event of an addressor wishing to cancel a message which has been sent, he should be requested to hand in a fresh message to the addressee, embodying this in its text.

Section 46.—Signaller's Messages

It may happen that it is desirable to give a distant station more complete instructions than can be conveyed by any of the station signals, the various uses of which have already been explained. Such instructions should, as a rule, be sent in the form of a message; they will then be written down and the form retained in the ordinary manner, but in rare cases, and then only by order of the senior signaller present, the stop signal (PP) will be made. When this has been answered by the same signal, the instructions, etc., will be sent without any other preliminary signal. The signals VE and RD will be used as usual. If a reply to a question, etc., is at once sent, it is unnecessary to repeat the signal "PP." Such messages need not be written down.

Section 47.—Examples of Telegraph Forms with Morse Messages as Completed at Stations

The following examples of Morse messages show how the message forms should appear when completed at the three classes of stations. It is supposed that Colonel King on the General Staff of the 1st Division is the addressor and the message is handed in at the signal station at Bagshot at 8.10 a.m. on November 4, 1910, for transmission through Woking to Guildford. It is marked "Priority," and, Colonel King's name being on the list of officers entitled to send this class of message, is prefixed XB.

"A" Form. Army Form C. 2121.

MESSAGES AND SIGNALS.

As handed in. No. of Message.....

Prefix.....Code.....m.	Words.	Charge.	This message is on a/c of :	Rec^{d}. at..m.
Office of Origin and Service Instructions.				
.....	Sent		..... Service.	Date ....
.....	At .....m.		.....	From .....
.....	To			
.....	By		(Signature of "Franking Officer.")	By .....

TO				
	i/c	TRANSPORT	GUILDFORD	

*Sender's Number.	Day of Month.	In reply to Number	
A5	fourth	B2	AAA

Column	marching	DORKING	—	WOKING
arrives	GUILDFORD	9.15	attach	convoy
with	150000	rounds	ammunition	

FROM	HEADQUARTERS	1st	DIV.	
PLACE	BAGSHOT			
TIME		8	A.M	

The above may be forwarded as now corrected.

.....
Censor.

(Z) Priority C. King Colonel
General Staff

Signature of Addressor or person authorised to telegraph in his name.

* This line should be erased if not required.

Form I.—Shows the Message as handed in to the Signal Station.

"A" Form. Army Form C. 2121.

MESSAGES AND SIGNALS.

As Filed in Office of Origin. No. of Message....7....

Prefix XB Code HB Am.	Words.	Charge.	
Office of Origin and Service Instructions.	32		*This message is on a/c of:*
.....BT.....	Sent		Rec^{d}. at..m.
.....	At..... 8.15 a. m.	.....*Service.*	Date BT 4.11.10
.....Priority.....	To ....W K.....	.....	From .....
.....	By Corp^{l}. Smith, C.	(Signature of "Franking Officer.")	By .....

TO	i/c	TRANSPORT	GUILDFORD	

*Sender's Number.	Day of Month.	In reply to Number	
A5	fourth	B2	AAA

Column	marching	DORKING	—	WOKING
arrives	GUILDFORD	9.15	attach	convoy
with	150000	rounds	ammunition	

FROM	HEADQUARTERS	1st	DIV.	
PLACE	BAGSHOT			
TIME		8	A.M.	

The above may be forwarded as now corrected.	(Z) Priority C. King Colonel General Staff
.....	.....
Censor.	Signature of Addressor or person authorised to telegraph in his name.

* This line should be erased if not required.

Form II.—Shows the Form as completed for filing by the Signaller in Charge at Bagshot, after the Message has been correctly received by Woking.

"A" Form. Army Form C. 2121

MESSAGES AND SIGNALS.

As Filed in Intermediate Office. No. of Message....5....

Prefix XB Code HB Am.	Words. 32	Charge.	This message is on a/c of:	Rec^{d}. at 8.15 a.m.
Office of Origin and Service Instructions.				Date.. WK 4/11/10
..... BT	Sent		..... Service.	From ...BT. ...
.....	At ....8.22 a.m.		.....	By Pte. Jones, A.
..... Priority	To.....GD.....		(Signature of "Franking Officer.")	
.....	By Serg. Nixon, B.			

TO				
	i/c	TRANSPORT	GUILDFORD	

*Sender's Number.	Day of Month.	In reply to Number.	
A5	fourth	B2	AAA

Column	marching	DORKING	—	WOKING
arrives	GUILDFORD	9.15	attach	convoy
with	150000	rounds	ammunition	

FROM	HEADQUARTERS	1st	DIV.	
PLACE	BAGSHOT			
TIME		8	A.M.	

The above may be forwarded as now corrected.

..... *Censor.*

(Z)

.....

Signature of Addressor or person authorised to telegraph in his name.

* This line should be erased if not required.

Form III.—Shows the Form as completed at Woking after Transmission.

"A" Form. Army Form C. 2121.

MESSAGES AND SIGNALS.

As Filed and Delivered. No. of Message....9....

Prefix SB Code 8.10 a.m.	Words. 32	Charge.	This message is on a/c of:	Rec^{d}. at 8.22 a.m.
Office of Origin and Service Instructions.				Date .. GD 4/11/10
.....BAGSHOT.....	Sent		.....Service.	From ...WK...
.....	At .....m.		.....	By Cpl. Brown, T.
.....	To		(Signature of "Franking Officer.")	
....	By			

TO				
	i/c	TRANSPORT	GUILDFORD	

*Sender's Number.	Day of Month.	In reply to Number	
A5	fourth	B2	AAA

Column	marching	DORKING	—	WOKING
arrives	GUILDFORD	9.15	attach	convoy
with	150000	rounds	ammunition	

FROM	HEADQUARTERS	1st	DIV.	
PLACE	BAGSHOT			
TIME		8	A.M.	

The above may be forwarded as now corrected.

.....
Censor.

(Z)

.....
Signature of Addressor or person authorised to telegraph in his name.

* This line should be erased if not required.

Form IV.—Shows the Form as completed at Guildford, a Duplicate Copy of which will be given to the Addressee.

CHAPTER III

DESPATCH RIDING

Section 48.—General Information

1. **Employment.**—The employment of mounted or cyclist despatch riders will be governed by the nature of the country and the military situation. In special cases motor cars will be used for the conveyance of despatch riders. When favorable road and weather conditions exist, messages are best carried by motor or ordinary cyclists. Horses should not be used to carry despatches on hard roads if cyclists are available. Excessive speed and overwork must be avoided in order to lessen the chances of wear and accidents to the machine, and motor cyclists particularly must be saved unnecessary journeys at night or on bad roads.

2. **Motor Cyclists.**—Under good conditions the average speed of a motor cyclist may be reckoned at 20 miles and of an ordinary cyclist at 8 miles per hour. In reckoning the length of journey to be traversed allowance must be made for the petrol consumption of motor cycles. The disadvantage of cyclists as despatch riders lies in the facility with which they can be ambushed and captured. *Motor cyclists particularly should only be used on roads which are reasonably safe from hostile interference.*

3. **Mounted Men.**—A mounted man can carry despatches across country or by roads which are impossible for cyclists. Where headquarters are distant from a good road mounted men can be usefully employed in carrying messages to cyclist despatch riders for transmission. In such a case

the position of the cyclists should be at a known point on the road, as near as possible to headquarters. Although the speed of a mounted man is generally less than that of a cyclist, his greater immunity from capture and accident renders him in some cases a surer means for the transmission of messages.

Section 49.—Organization of Despatch Riders

1. At every headquarters to which despatch riders are allotted an officer or non-commissioned officer in charge of despatch riders will keep a roster for each class of despatch rider, and will see that the next for duty is ready to start without delay.

2. To enable messages to be rapidly despatched, the accommodation provided for men, cycles, and horses should be in the close vicinity of headquarters.

3. It will often be advisable for mounted or cyclist despatch riders to work in pairs, except for short distances. Horses go better in company, greater security is obtained, and there is less chance of failure through breakdown.

4. Despatch riders should be equipped as lightly as possible in order to increase speed, to reduce fatigue, risk of capture, and wear of the machine used.

5. Arrangements must be made for the supply of oil, petrol, light, and such spare parts as may be required to keep the machines in order.

6. On the line of march the arrangements for the march of the despatch riders are influenced by the following considerations:—

(i) To meet the signal service requirements of the headquarters.

(ii) To cause least inconvenience to the troops on the road.

(iii) To save the despatch rider moving at a pace or over ground unsuitable to his mount.

7. When a headquarters is moving with troops and has motor cyclist with it, it is desirable that they should move

in the space between the head of the main column and the advanced guard, or on a parallel road. In the latter case it would be necessary for them to move by bounds, halting at certain points for such periods of time as may be ordered. In the event of such order not being received they should communicate their position to headquarters.

8. In order that delay should not occur in the delivery of messages to a headquarters it is necessary:—

(i) If the report centre of the headquarters is not in the immediate vicinity of a road, that arrangements should be made for intercepting despatch riders at a suitable point on the nearest road, and that other headquarters should be informed as to the location of this point.

(ii) If the report centre is moved, that a non-commissioned officer or man of the signal service should be left at the point referred to in (i) above to redirect despatch riders to the new report centre, remaining at this point sufficiently long to ensure that despatch riders who may have left their headquarters before the notification of the change have had time to arrive.

Section 50.—Relay Posts

1. If messages have frequently to be carried between any two points, which are far apart, relay posts, consisting generally of a few mounted men, cyclists, motor cyclists, or motor cars may be necessary. They will be organized by the signal service under the direction of the General Staff.

2. The number, strength, and location of posts depend on many conditions, such as the means of locomotion, the attitude of the inhabitants, the nature of the country, and the state of the weather.

3. Except for long distances, motor cyclists or despatch riders in motor cars should work through without relays. *Six miles for horses, 8 miles for bicycles, and 20 miles for motor cyclists would usually be the maximum distance between relay posts.*

4. In the case of despatch riders maintaining communication with a reconnoitring detachment of cavalry, the posts should be carefully hidden, well away from towns and villages, and close to water. At times, however, concealment may be impossible and they will be compelled to rely on force for their protection. In such circumstances the commander who establishes the post should be careful that its strength is sufficient for the task it has to perform.

As the reconnoitring detachment advances the despatch riders should have their attention drawn to all roads and landmarks likely to be useful in their return journey. They must always report on the condition of a road and disseminate the knowledge to the despatch riders of the signal office to which they are sent as well as to those of their own signal office on their return.

5. In other cases, the number and situation of relay posts will probably be governed by technical rather than by tactical considerations. In these circumstances the post should be placed at a point that can readily be found, where accommodation and supplies of food, forage, or petrol are available. When such posts consist of motor cyclists, arrangements should be made, if possible, for one member of the post to be a motor cyclist artificer corporal.

6. When in a friendly country, the position of a post will be clearly marked by day and by night. This may be done by means of ordinary signal flags by day, and lamps by night (if lights are allowed). If the inhabitants are hostile, the approximate position should be given as accurately as possible to the despatch rider before starting, and the post must be on the lookout for incoming despatch riders; the post itself should be hidden. A guard may be necessary for the post. A register of the messages forwarded will be kept at each post, the date, hour of receipt, speed enjoined, and name of despatch rider being noted.

7. The commander who establishes a system of relay posts must clearly lay down when and by whom they may be withdrawn, and must also appoint a commander for the whole line.

Section 51.—Duties of the Individual Despatch Rider

1. **Duties.**—The duty of a despatch rider is to convey written or verbal messages between the headquarters to which he is attached and any point within the area of operations. A despatch rider will obtain an acknowledgment for all messages delivered by him, receiving instructions as to the nature of acknowledgment required before starting. This acknowledgment usually takes the form of the receipted envelope.

2. Unless specific orders to the contrary have been given him, a despatch rider will work from signal office to signal office. In the case of units, *e.g.,* regiments or battalions, the signal office will be represented by the adjutant or signalling sergeant. Before starting a despatch rider will check the numbers of messages handed to him, and will receive instructions as to the signal office to which he is to go, the route he is to follow, what action he is to take if he does not find the addressee at the place indicated, where he is to return to, the pace he is to travel at, and any information available that may be of use to him as to the whereabouts of our own or hostile troops.

3. A despatch rider should, therefore, *commit his route to memory, before starting,* noting from the map any particular places which he must pass. Valuable time is lost by constant halts to look at the map. It will often save time to instruct the despatch rider to make detours to avoid columns of troops or transport, or to secure a good road.

4. Both while going and returning he should make mental notes of the troops met with, the situation, or any points which it may be useful to report to his signal office. Villages, houses and places where the enemy are likely to be situated are to be avoided. Halts must be made at suitable points to look over the country to be traversed and progress made by passing from one lookout point rapidly to the next.

5. *A despatch rider will not carry any written instructions, diaries, or papers such as might give information to the enemy, other than the messages he is entrusted with.*

6. In the presence of civilians, whether friendly or otherwise, no mention should be made of the direction from which he has come or of his destination.

7. The despatch rider must, *in the event of capture, take such steps as are possible to prevent his messages falling into the enemy's hands.* Messages must, therefore, be carried where they can be quickly got at, so as to destroy them or get rid of them where they will not be found. On no account should they be carried in the cap. *If captured he must never disclose more than his name and rank when questioned.*

8. At his destination he must obtain a receipt, give any information, take over any messages that there may be to go back, and return without delay. It is frequently almost as important for the sender to know quickly that the message has been delivered as it is to have got the message through.

9. Arrived at his own signal office he must report arrival, hand in receipts for messages he took out, and deliver any messages which he may have brought back. These latter messages will be acknowledged by the signal office at the first opportunity. He should also report any facts of interest noted on the road, ascertain how he stands on the roster for duty, and, if necessary, what time he can count on for food, care of his horse or machine, or rest, as the case may be.

10. The bearer of a verbal order or message should repeat it to the issuer and understand its purport. Before delivering his message he should carefully consider what he was told to report or repeat, and then give his message without flurry. The persons to whom the order or message is delivered should commit it to writing and request the bearer to sign it, if it is of any importance.

11. The bearer of a written order or message will not usually know its purport. In the event of having to destroy it he should try to master its contents before doing so. In wet weather it may be advisable to enclose the despatch in two envelopes.

12. A despatch rider on approaching the addressee will call out in a loud tone "message for——" and the name of

the addressee; he will then deliver his message and will see that he obtains a receipt. It is the duty of all to assist him in finding the addressee.

13. Despatch riders bringing messages from advanced bodies of troops should carry them unsealed. Commanders of troops, whom such despatch riders may pass on their way to the addressee, are authorized to read the message, which they should initial. In carrying this out it is highly important that such despatch riders are not detained a moment longer than can be avoided.

Section 52.—Delays on the Road

1. All troops are instructed to give a despatch rider every facility to proceed. When assistance is required, application should be made to the officer in command. Commanders will assist in forwarding messages by all means in their power, supplying a new despatch rider, if necessary, or replacing tired horses by fresh ones.

2. In the event of a horse being unfit to travel, or of serious mechanical trouble with bicycles, motor cycles, or motor cars, a long time is not to be spent in endeavoring to make good defects if other means for continuing the journey can be procured. Each such case must be decided according to circumstances and a quick decision made by the despatch rider. It will only in exceptional circumstances be correct for a despatch rider to hand over messages with which he has been entrusted to any one else to carry on and deliver. When a despatch rider is unable to proceed he must report if possible to an officer and, if no officer be present, act according to his own judgment. A despatch rider must himself keep a record of the person to whom, and the time and place, he handed over any messages, and forward this information at the first opportunity both to the signal office that sent him out and the signal office of destination.

3. It is important that all despatch riders should bear in mind the necessity for keeping their signal office informed of any accident or delay.

Section 53.—The Training of Despatch Riders

The training of a despatch rider should aim at producing a man with the following qualifications:—

(i) He must be fit and in hard training, be a good horse-master, and be capable of finding his way across country. He must know how to keep serviceable any mechanical means of transport with which he is entrusted, and be able to ride a bicycle or drive a horse.

(ii) He must be able to read a map quickly, to locate his position on a map, and to commit to memory the route he has to follow.
He should be capable of finding his way by day or by night, and be able to check his direction by the sun, stars, or compass.

(iii) He must have good "scout" knowledge, because in a hostile country or one into which the enemy may have sent patrols a certain amount of scouting must be done by despatch riders for their own safety, even though it may much delay their progress.

(iv) He must be thoroughly trained in delivering correctly a verbal message.

(v) His powers of observation must be trained so that he may be able to note and report what troops he has met on the road, and other details that may be useful.

(vi) He must know the names and rank of the generals, staff officers, and commanders of units, and the designations of the various troops composing the force with which he is concerned, the commands to which they belong, and where he is likely to find the headquarters or signal office or person for whom he has a message.

(vii) He must be impressed with the importance of not causing moving troops any possible inconvenience.

Note.—Instruction in scouting and delivering verbal messages, together with the development of the powers of observation and memory, are dealt with in the *Field Training* in this book.

CHAPTER IV

MAP READING

Section 54.—Importance of Map Reading

1. Map reading is an extremely important part of military training. A knowledge of it is essential for the efficiency of leaders of every rank, as well as for scouts, despatch riders, and signallers. This knowledge, moreover, is extremely useful for every soldier, and it should form part of the instruction of every man.

2. In war every leader, however small his command, is supplied with a map, that will give him a mass of important information without which he could neither move nor act with certainty. It will tell him, for instance, the shortest route from one place to another, whether he will be able to take his transport by certain roads, where he can obtain water, how he can best conceal his movements from the enemy, the most suitable ground to examine for attack and defence or for outposts, what points are visible from other points for the purpose of communication work, and many other details necessary to the successful performance of his duty.

3. **Elementary Instruction.**—Through constant practice the eye can be trained to carry from the map to the brain in a flash, details of information which would be missed altogether by a less practised vision after long and close scrutiny. For military purposes it is essential to train the eye to gather all necessary information extremely quickly and accurately. In war unnecessary delay and mistakes of

any kind should be avoided at all costs, as their consequences may prove disastrous or irretrievable.

4. Elementary training in map reading should be begun on a large-scale map—if possible, a six-inch ordnance map of the country round the headquarters of the unit. Small maps are apt to puzzle a beginner, especially in "close" country, and small by-roads, among other details, are frequently omitted. All the objects with which men are familiar, such as buildings and roads, should be pointed out to them. When the men have become familiar with the appearance on a map of country which they know, they should be taught to measure distances with the aid of a scale, learn the conventional signs, be instructed in the use of the magnetic compass, and then proceed to setting and reading maps.

5. **Map Reading Tests.**—Tests in map reading suggested for the examination of scouts will be found in the *Field Training* Manual of this book, and will also serve for tests in map reading for men generally. They test the power of men in using and reading a map, and especially with regard to the following points: finding their position on the map; recognizing objects in country marked on the map; identifying their position by setting a map and using the scale; finding their way across country by the aid of the map.

Section 55.—Scales

1. The first and most important detail of a map is the scale to which it is drawn. The word scale is used to denote the proportion which a distance between any two points on a sketch or map bears to the horizontal distance between the same two points on the ground.

2. Thus, if the distance between two houses on a map be one inch, and the horizontal distance over the ground as the crow flies be one mile, the scale of the map will be one inch to one mile. Similarly, the statement that a map is in the scale of $\frac{1}{63360}$ means that a distance of one inch

on the map represents a distance of 63,360 inches, or one mile on the ground.

3. On taking up a map to read it the scale should be studied carefully. If, for instance, it is a scale of one inch to a mile, the eye should be trained by practice to recognize the length of an inch on paper. It can then readily estimate the distance between two points on the map with considerable accuracy—a faculty of great importance in all branches of military work.

4. The increased range of modern firearms has affected the question of the scales of military maps and sketches. It is obvious, if troops come into action at longer ranges than formerly, that battlefields and military operations generally will cover greater areas of ground. Consequently maps must include larger areas of country, and the scales in which they are made must be smaller. Scales which were suitable for use in the days when troops fought in close order and massed formations at short ranges owing to the limited range of firearms, would, if employed now, show but a small portion of the vast battlefields necessary for engagements between troops fighting in extended order with modern weapons.

5. This does not mean that large scales will never be used. Their importance, however, has diminished, while that of small scales has increased. It is clear, of course, that in "open" country, namely, country without much detail, such as wide tracts of level plain devoid of many natural or other features, the scales in which maps are made may generally be smaller than in "close" country, such as hilly or even level land crowded with detail, because in the latter case, if the scale is too small, the details may tend to become crowded and confused. But even in close country, it is found that a scale of two inches to a mile is sufficiently large for general use.

6. As already stated, small-scale maps are more difficult to use and read for a variety of reasons. For instance, in moving across country with the aid of such a map it will be found that small by-roads are not shown upon it. This may

puzzle the beginner, because he is unable to estimate his progress by counting each turning he passes along a road. Under these circumstances he may estimate his progress by noting the time taken in travelling from point to point on the map, if the rate at which he is travelling is known and steadily maintained. Thus, if the map shows the next cross-road to be a mile ahead of him he will take about twenty minutes to reach it marching at an ordinary pace, so that if a cross-road is passed in ten minutes he may safely conclude it to be one not shown upon the map. Again, a man may be puzzled by finding that short but decided turns in a road are often not shown at all upon the map. In regard to this point it must be remembered as a general rule that all curves and bends look far more decided on the ground than they will appear reduced to scale upon maps.

Section 56.—Conventional Signs

1. Maps consist of three features—outline, detail and writing.

Outline consists of anything which can be shown in plan, such as a lake, village, or town.

Detail consists of natural features such as woods, marshes, rocks, hills, churches, and towers, which are shown by conventional signs.

Writing includes lettering and figures, and is used to denote names, distance, direction of roads, and the position of telegraph offices, post offices, sign-posts, wells, letter-boxes, etc.

2. In all maps and sketches the features of the ground, and any details which from want of space cannot be shown in the plan, are represented conventionally. Thus roads, rivers, lakes, buildings, etc., are shown by lines representing their outline or plan. The irregularities of the ground are conventionally represented by contours or shading, and woods, marshes, railways, bridges, etc., are distinguished by conventional signs.

Section 57.—Hill Features

1. There are two methods by which hill features are represented on British Ordnance Survey maps:

(i) *By contours.*—Each contour is figured at frequent intervals along its course to show its height in feet above sea-level.

(ii) *By figured levels.*—The heights of various points are marked in figures.

2. In order to assist the eye small-scale maps are usually either colored or shaded. When colored—as in the Ordnance Survey map, the scale of which is two miles to one inch—the

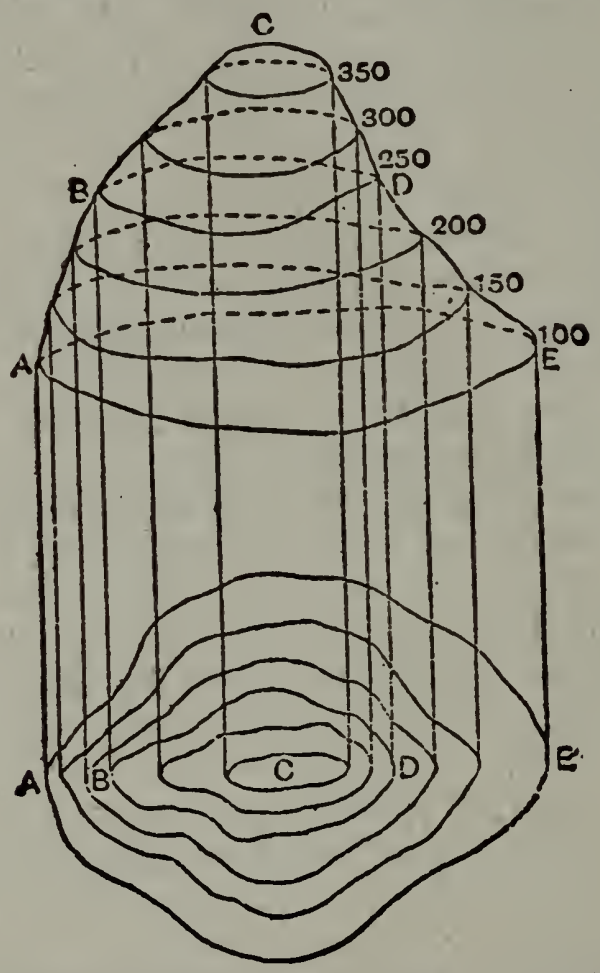


FIG. 2.—PLAN OF HILL AND VIEW WITH CONTOURS.

Steep Slope = A to B and C to D.
Gentle " = B to C " D to E.
Concave " = C to E.
Convex " = A to C.

highest levels are shown darkest, those lower being shown less dark as their height decreases. When shaded—as in the case of an ordnance map with a scale of one inch to a mile—the slope of the ground is shown by *hachuring,* or by short parallel lines drawn down the slope. The hachures are thickest when the slope is steepest.

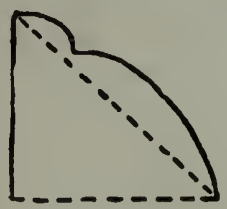


FIG. 3.—CONVEX SLOPE.

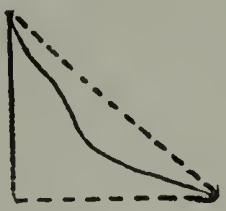


FIG. 4.—CONCAVE SLOPE.

3. **Contours.**—The nature of a contour is best explained by the following examples: A large apple of irregular shape is placed on a table and cut through horizontally with a sharp knife, while the knife is held parallel to the surface of the table and about one inch above it. After the top piece of apple is removed, any one looking vertically down on the piece remaining on the table will see the irregular line of the skin of the apple where it has been cut, showing a contour line in plan of the apple. Imagine the table to be at sea-level and the apple to be the earth, then we have by this means obtained a representation of a contour of the earth's surface at a height of one inch above sea-level.

4. **The Vertical Interval.**—The difference in height between any two adjacent contours is always a fixed number of feet, called the vertical interval. Thus, if one contour be 200 feet above sea-level, and the contour next to it be 250 feet above sea-level, the contours on that map are said to be placed at 50 feet vertical interval. The vertical interval is stated on every map.

5. **Slopes.**—The different kinds of slopes are illustrated in Figs. 3 and 4. They are termed uniform, concave, or convex.

(*a*) *Uniform Slope.*—A slope is uniform when it passes over successive contours which are at equal intervals

apart. The slope is *gentle* when the contours are wide apart, and *steep* when they are close to gether. The longer dotted line in Fig. 3 represents a uniform slope.

(*b*) *Concave Slope.*—A slope is concave when it passes over successive contours of which the lower are wide apart (Fig. 2, line C to E) and the upper close together (line C to D). The middle of the slope is, so to speak, hollow or bent in (Fig. 4).

(*c*) *Convex Slope.*—A slope is convex when it passes over successive contours of which the lower are close together (Fig. 2, line A to B) and the upper are wide apart (line B to C). This slope is rounded or bent outward in the middle (Fig. 3).

Section 58.—The Compass

1. **Points of the Compass.**—There are 4 cardinal points of the compass—namely, north (N.), east (E), south (S.), and west (W.). There are four intermediate points—namely, north-east (N.E.), south-east (S.E.), south-west (S.W.), and north-west (N.W.). There are in all 32 points on the complete dial of a compass, together with 360 equal divisions called degrees.

2. **Magnetic Variation.**—(i) The needle of the compass does not point to the true north, but to the magnetic north. The difference between the direction of the true north and the magnetic north upon the dial of a compass is called its variation (Fig. 6). The variation differs in every part of the world according to its position relatively to the magnetic north. The degree of variation in different parts of the world also changes at a rate which is uniform. At the present time the variation in France is 16° west of true north. This means that the compass needle when at rest will, instead of pointing true north, point 16° to the west of it. The magnetic variation in any place if not marked on a map may be ascertained as described in Section 61, para. 2 (iii).

(ii) **Ordnance Survey Maps.**—It is useful to remember in map reading that the sheet-line margins of the small scale Ordnance Survey maps are rectangular and drawn parallel to a central meridian or true north and south line. For sheets through which this meridian passes the marginal lines are nearly true north and south, with the north towards the top of the sheet. For the sheets to the east and west the margins deviate from the true north; the maximum deviation, however, in the extreme east and west counties is not more than 4° east or west respectively. Where a magnetic or a true north point is shown, it may save errors to draw on the face of the map a few lines parallel with it to remind the reader of its direction.

3. **Variation of the Compass.**—The variation of a compass may be found by setting an ordnance map as described in Section 61, and noting the approximate direction of the true north as indicated by the sheet-line margin (see para. 2 (ii) above). The bearing of the true north may then be taken by placing the compass on the margin of the map so that the north and south line on its dial coincides with the edge of the sheet-line margin. The variation of the compass from the approximate true north can then be seen and read off.

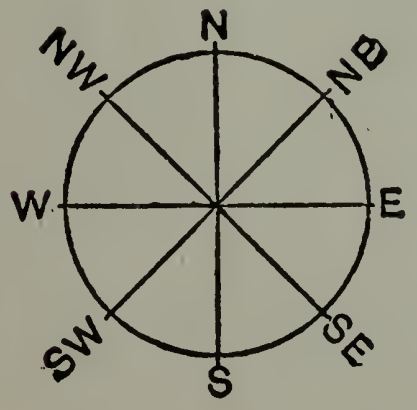


FIG. 5.
POINTS OF THE COMPASS.

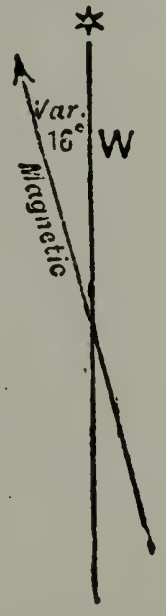


FIG. 6.
MAGNETIC VARIATION.

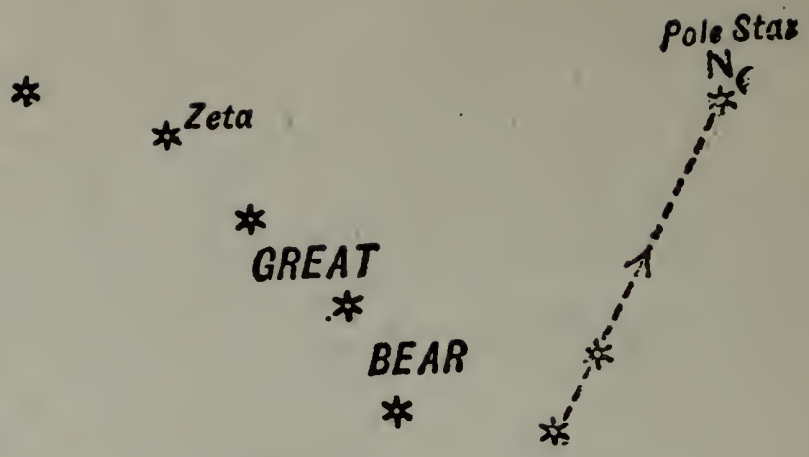


FIG. 7.—POLE STAR.

FIG. 8.—POLE STAR.

The two stars on the right, as you look at Fig. 7, point to the Pole Star, which is approximately true North. But, as the stars revolve round the Pole, the Great Bear is sometimes in the position shown in Fig. 8.

It must again be remembered that only rough results can be obtained by this method, because it is impossible to set the map as described in Section 61, with precise accuracy, and its sheet-line margin is only approximately true north. As, however, it will be difficult or impossible to obtain absolute accuracy in using the map and compass with the cheap instrument which will usually be available in cadet corps, these rough results must suffice for the elementary instruction of recruits in the principles of map reading.

4. **Bearings.**—A true bearing is the angle a line makes with the true north line. A *magnetic* bearing is the angle

a line makes with the magnetic north line (Fig. 6). The direction of an object taken with the compass expressed in degrees relatively either to the magnetic north line or the true north line is respectively called the magnetic bearing or the true bearing of that object, as the case may be.

5. **The Service Prismatic Compass.**—(i) The service compass consists of a magnetic needle balanced on a pivot, and carrying a dial divided into degrees, contained in a metal box, round which is a brass ring graduated to show every fifth degree and the points of the compass (see Fig. 9). The metal cover, C, opens on a hinge, and is fitted with a glazed window, W, on which is traced a fine black hair-line, V, for use as a sighting-vane. Opposite the hinge of the cover is fitted a prism, R, through which can be read the graduated edge of the dial, while at the same time an alignment of the object and of the sight-vane on the cover is observed through the slit above it. The prism should be moved up or down in its slot till the figures on the dial are properly focussed. A clamping-screw, S, is provided for clamping the needle when not in use, and a check-spring, A, for checking its oscillations when observing. A brass ring, B, is attached for convenience in holding it.

(ii) The dial is luminous for night work, the north point is marked with a large diamond-shaped figure. A revolving glass is fitted over the compass dial, and on the glass is a black direction mark, radiating from the centre, at the end of which is a small brass setting vane, the latter working over an external arc graduated to 360°. A brass screw, J, is used to clamp the glass. On the inside of the cover are two luminous patches, PP, which give a good alignment of the instrument at night when it is held in the hand with the cover wide open. There are two small holes, HH, in the brass window-edge of the cover, so that, if the glass breaks, a horse-hair can be run between them, and an extemporized sight-vane be utilized.

(iii) The compass dial is graduated with two sets of figures which read eastward of the meridian, or from left to right, like the hands of a watch. The outer set is for use

with the prism, and commences at south in order that the bearing of the object may appear under the eye. Thus, the vane being directed on an object which is 50° from north, it is that number measured from south which appears under the prism; or, in other words, 180° is over the north end and 360° over the south end of the needle. The inner set of figures is of use for direct readings (*i.e.* without the prism), as for compass marching, or when the instrument is used with the plane-table.

6. **Use of the Service Prismatic Compass.**

(i) **Ascertaining Angles.**—The prismatic compass gives bearings and not angles. The horizontal angles between any distant objects are obtained by taking the difference of their observed bearings.

Example.—The angle between two points, A and B, is required. Their bearings are observed to be respectively 50° and 110°. The angle required = 110°—50° = 60°.

(ii) **Taking Bearings.**— (*a*) *Instrument used as a hand compass.*—Hold the compass level in the hand, or place it on a level surface; when the card comes to rest.

The check spring can be used to steady the swing of the card so that it may more rapidly come to rest.

The graduation on the *inner* ring of figures, immediately under the index line, gives the magnetic bearing.

(*b*) *Instrument used as a prismatic compass.*—In order to obtain the bearing of a distant point, the observer directs the sighting vane of the compass on the object and reads its magnetic bearing in the prism.

(iii) **Night Marching.**—(a) To use any compass with advantage on a dark night, it is essential that it should be prepared with luminous paint. *This substance must be kept exposed to the light before using it, or it will be found to be non-luminous when required.* As a general rule, a compass exposed for *half an hour before sunset* will be sufficiently luminous to work by *for some* 6 *to* 9 *hours afterwards.*

(*b*) The magnetic north is marked by a broad black arrow-head in the service prismatic compass. It is so con-

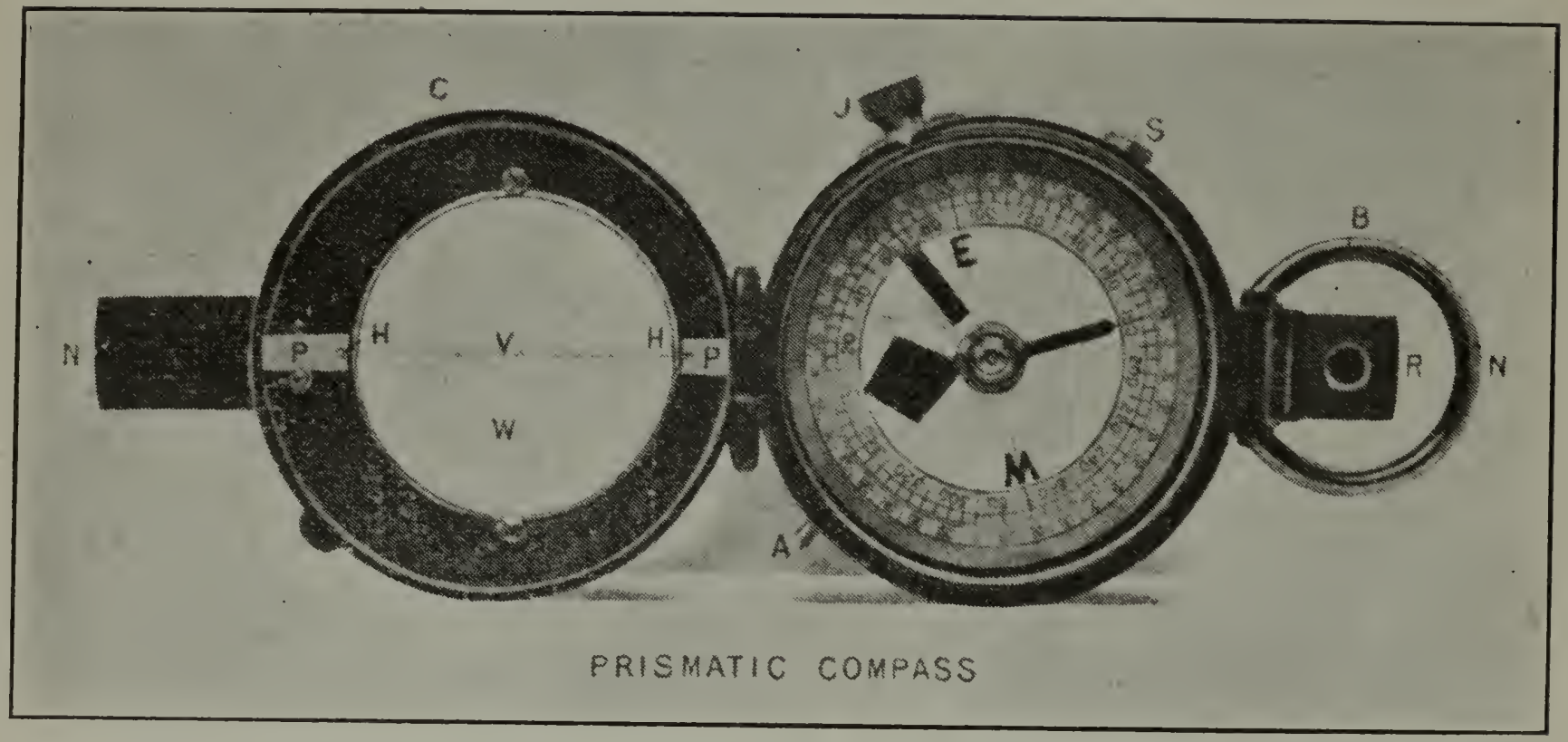


FIG. 9.

structed that upon the black direction mark being turned to point to the required bearing, as shown on the external ring, and the arrow-head being made to correspond with the black direction mark, the *line between the luminous patches in the lid indicates the line of advance.*

(*c*) It will thus be seen that in the service compass no attempt is made to read degrees or points by means of luminous paint. Such a proceeding is impracticable, and if depended upon would only lead to disappointment and failure. *The utmost that can be expected from luminous paint is for a compass prepared with it to show a faint luminosity of the dial, just sufficient to throw up in relief the black direction mark and arrow-head.* As a rule, the darker the night the greater the assistance afforded by the luminous paint. *During a moonlight night a luminous compass is of no greater value than an ordinary compass with a clearly marked north point.*

Keeping Direction.—(*d*) In using a compass during a night march, some means should be adopted to prolong the line of advance as shown by the compass, and thus clearly indicate the route to be followed. A stick painted white or with white paper pasted on it, or, best of all, one prepared with luminous paint is most useful. The operator, standing perfectly steady, should wait until his compass has come to rest, and then hold the stick, at an angle of 45° to 60° with the horizontal plane, in the direction indicated by the line between the luminous patches in the compass-lid.

With the stick thus held it is easy to pick up some object to march on, and the advance is then resumed until it is considered desirable to halt, allow the compass to settle, and observe the direction of advance afresh.

Keeping Direction, Another Method.—(*e*) But it may happen that, owing to clouds or fog, no terrestrial objects to march on between the halts are visible. Then the only safe way is for an assistant to stand behind the observer and work as follows: The guide with the compass and luminous stick, as soon as the compass becomes steady, gives the word *steady.* The assistant, carefully noting the alignment

of the luminous stick, then advances in what he judges to be the right direction, until the guide halts him, before he is lost to sight, by giving a low whistle.

The guide, having thus halted his assistant, notes by means of the compass whether the latter is standing on the true line of advance or to the right or left of it. He then moves up, and placing himself on what he judges to be the correct alignment, sends forward his assistant again.

Slabs of cardboard or wood, prepared with luminous paint, are of great assistance in this tedious process of sending on an assistant; a slab, 12 inches square, can be seen at from 70 to 150 yards distance, according to the condition it is in, and by this means the rate of advance can be greatly accelerated.

Besides the guide and his assistant, a third person should be employed to keep a careful record of the distances traversed.

The rate of advance obviously depends on the distances covered between halts; after the first few advances the assistant will have ascertained the number of yards he can safely proceed without being lost to sight, and on reaching that distance he will halt without waiting for the whistle. This is important, since the whistling might give notice to the enemy as the force approaches the objective.

7. **The Ordinary Compass.**—The service prismatic may be too expensive and too complicated for the elementary instruction of recruits in the use of the compass in connection with the training laid down in this chapter on map reading. For this purpose a simple, inexpensive instrument should suffice, the dial of which may be luminous, and should indicate at least 8 points of the compass, each of which is equal to 45° (Fig. 5).

8. **Taking Bearings with Ordinary Compass.**—(i) To take the bearing of an object with an ordinary compass the following directions should be observed: Place the instrument horizontally on a level surface. When the needle or dial is stationary take anything which gives a straight edge,

such as a piece of string, folded paper, a pocket ruler, or a piece of stick. Place the straight edge on the pivot of the needle, or so that it runs directly through the centre of the compass dial, and keeping it there shift it without disturbing the position of the compass so as to align it exactly with the object of which the bearing is desired. Then read off the bearing at the point where the straight edge cuts the ring of divisions on the dial. If this point does not coincide with a division, the bearing must be calculated roughly by measuring the distance between it and the nearest division marked on the dial.

(ii) In the case of the prismatic compass the exact bearing of the object may be read by holding the compass to the eye and looking through the prism and aligning the sighting vane on the opposite side of the instrument on the object of which the bearing is desired. When the dial comes to rest, the bearing may be read by a downward glance without removing the compass from the eye.

(iii) The true bearing can always be ascertained by adding or subtracting the magnetic variation of any locality with reference to the bearing taken. Allowance must always be made when necessary for the instrumental error.

Section 59.—Taking Bearings from a Map

1. This can be done roughly in the case of small-scale Ordnance Survey maps by drawing a straight line from one point to the other and continuing it until it cuts the sheet-line margin of the map which runs approximately true north and south (see Section 58, para. 2 (ii)). The angle made by the line drawn across it with the edge of the map will give the bearings of the two points in relation to one another.

2. In the case of a map on which the direction of the true north is indicated, the relative bearings of any two points upon it may be found by drawing a line from one to the other, and continuing it till it crosses another line drawn on the map in the direction of the true north. The angle formed

by the two lines where they cut one another will give the relative bearings of the two points on the map.

3. In both the above cases the relative bearings will refer to the true north line. The magnetic bearings can easily be ascertained according to the variation of any locality.

Section 60.—Methods of Finding the North and South

1. The approximate direction of the North and South may be found by the use of (i) a compass; (ii) the shadow of the sun; (iii) a watch; (iv) the Pole Star; and (v) the Southern Cross. None of these methods should be used for determining the magnetic variation of any place, as they are not sufficiently accurate. The use of the watch should not be practised in the tropics. The results it gives become more accurate as the distance North or South from the Equator increases.

2. With respect to the shadow of the sun at noon it must be remembered that apparent noon may differ from mean local noon—12 o'clock by a watch—by as much as sixteen minutes. Moreover, most countries now keep standard time of some particular meridian for use in railways and telegraph throughout the country, so that the time in actual use may differ considerably from the mean local time. For these reasons the sun in any place may be appreciably off the meridian at noon by the watch. Despite these considerations, which should, however, be borne in mind, the methods tabulated below will be found of practical use in finding the approximate direction of the North and South.

Method.	Directions for finding the North and South.
(i) *Compass*	A correct compass in both the Northern and Southern Hemispheres will show the true North a certain number of degrees to the right or left—that is to say, east or west—of the needle, according to the variation in

Method.	Directions for finding the North and South.
	any part of the world. For example, the true North in England is about 16° to the east of the needle. The point exactly opposite to it will indicate the South.
(ii) *Shadow of the Sun.*	(*a*) The position of the sun at noon in the Northern Hemisphere is approximately South. The shadow of a stick placed upright in the ground will therefore point approximately due North. (*b*) The position of the sun at noon in the Southern Hemisphere is approximately North. The shadow of the stick will therefore point approximately South.
(iii) *Watch*	(*a*) The direction of the true North may be found approximately with a watch in the Northern Hemisphere by observing the following rules: Hold the watch horizontally with the face upward. Point the hour-hand at the sun. Then a line from the centre of the dial to a point half-way between the figure XII and the point of the hour-hand is a line running in the approximate direction of the South. The opposite direction will give the approximate direction of the North. (*b*) In the Southern Hemisphere the rules for finding the true North are as follows: Hold the watch horizontally with its face upward. Point the line from the centre of the dial to the figure XII at the sun. Then the line from the centre of the dial to a point half-way between the figure XII and the pointer of the hour-hand is approximately a North line. The opposite direction gives the approximate direction of the South.
(iv) *Pole Sar*.....	The approximate position of the North and South may be found in the Northern Hemisphere by means of the Pole Star at night, as shown in Figs. 7 and 8.
(v) *Southern Cross.*	In the Southern Hemisphere the following alternative directions will enable the approximate position of the South to be found by means of the Southern Cross:

Method.	Directions for finding the North and South.
	(*a*) Consider the Southern Cross as a kite. Imagine a line drawn starting from the head star in prolongation of the longer axis of this kite, the total length of which is equal to 4½ times the distance between the head and tail stars. The point reached at the end of this line will be within 1° of the South Pole. (*b*) Take a piece of paper and mark off on its edge nine equal divisions. Hold it so that the left edge of the paper and the second division mark coincide respectively with the head and tail stars. The ninth division mark will then give the approximate position of the South Pole (Fig. 10).

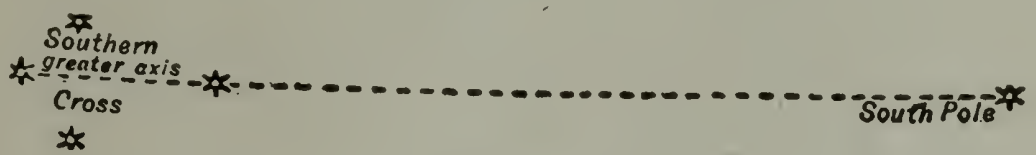


FIG. 10.

Section 61.—Setting a Map

1. A map must be "set" before it can be read. By "setting" a map is meant placing it so that the true north on the map points to the North Pole and the relative positions of the places marked on it correspond with the actual position of the same places on the ground. When men have set a map, they should be taught to identify as many as possible of the objects marked on it which are visible in the surrounding country shown on the map. A map may be set for reading in any of the following ways:

2. **Setting by Compass.**—(i) If the magnetic north line is marked on a map, lay the compass over it and turn the map without disturbing the position of the compass until the north end of the magnetic north line on the map is exactly

under the north end of the compass needle. Allowance must be made in doing this for the special variation of the compass used (Section 58, paras. 2 and 3).

(ii) If neither the magnetic nor the true north is marked

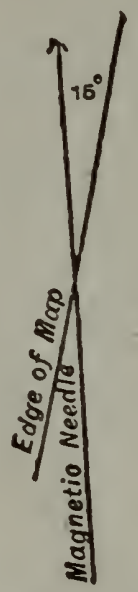


FIG. 11.

on the map, lay the compass on the right edge or sheet-line margin of the map and turn the latter until the right edge or sheet-line makes an angle of a degree corresponding to the magnetic variation of that place, with the needle on the right or left side of the edge as the variation is respectively east or west (Fig. 11). The reading should then be corrected to allow for the instrumental error, if any, of the compass used.

(iii) If the true north line is shown on the map, place the compass with its centre on a true meridian and turn the map until this line makes with the needle an angle equal to the variation of the compass and on the correct side of it. If the instrumental error of the compass is known the local magnetic variation can be discovered approximately by this method.

3. **Setting by Objects.**—(i) To set a map by objects on the ground without using the north point or compass, the

reader must correctly identify his position on the ground where he stands as some point marked on the map. He must also identify on the map some distant object he can see in the surrounding country. He must join these two on the map by drawing a straight line in pencil from one to the other. Finally, he must face in the direction of the distant object and turn the map about until he sees that the line which he has drawn from the point which marks his position on the map to the distant object on the map is also in a straight line with the distant objects on the ground. This will give him his position on the map.

(ii) A map can also be set approximately by identifying several prominent objects marked on it which are also visible in the surrounding country or by standing on or near some straight feature marked on a map such as a straight road, railway, river, canal, etc. The map is then held so that the directions between these objects as they appear on the ground and on the map are parallel to one another.

4. **Another Method.**—If the reader has no compass, but possesses a map showing the magnetic north, he may set it by first finding the approximate true north (Section 60) and marking it by a point on the map. He must then turn the map about until the point marking the magnetic north upon it lies the correct number of degrees west or east of the true north as shown by his marking. The number and direction of these degrees will depend upon the magnetic variation in any place.

Section 62.—Map Reading on the Ground

1. The following rules lay down a progressive course of instruction in map reading on the ground. They are intended to serve as a rough guide to instructors, who may vary them at their discretion. The various exercises outlined in the rules should, if possible, be carried out on the ground with the aid of a large and small scale map to accustom men in reading both with equal facility.

2. The reader must first note the scale of the map and get his eye accustomed to estimating distances on it. He must then carefully examine the heights and contours, noting the vertical interval in feet between successive contours (Section 57), and try to get an idea of the general form of the ground.

3. He will be assisted in noting the rise and fall of the ground by reason of the fact that spot levels, namely, the height of any particular spot, are often shown on heights, along main roads and railways, at villages, and other places marked on maps. He may gain an impression of the steepness of the hillsides by mentally comparing the country represented with one he knows well.

4. The direction of the north—both true and magnetic —must then be noted, and the map examined carefully in relation to these points. Time may be spent most usefully in imagining the various details of the map as actual country, and noting the positions of watercourses, and the position and direction of streams, rivers, ridges, water-sheds, and spurs. Knowledge gained by this scrutiny before moving across country may save hours of unnecessary wandering about in it, due to avoidable mistakes of direction.

5. In scrutinizing the map the reader should note whether country is wooded or the reverse, the size of the villages and number of farms, the roads, railways, canals, bridges, and artificial features generally and whether roads, rivers, railways, etc., pass under or over the various bridges. The distances between some of these objects, a knowledge of which is likely to prove useful, should be measured on the map with the aid of any convenient scale, and noted down or remembered.

6. When these exercises have been carried out, the map should be taken out to some point on the ground which can be identified, and from which the country itself can be studied. The reader should look well at the country before him, noting its various heights and prominent objects, and mentally converting the distances between them into inches according to the scale of the map used.

7. When he has thoroughly studied the country, so to speak, and mentally mapped it so that he can imagine what it would look like in a map, the reader must turn to his map, "set" it, and compare it with the actual ground in front of him, and note the particulars in which it differs from his conception of what a map of the country would look like. The reader will learn more by this system of imagining or visualizing a map by looking at actual country and then comparing it with a map of it, and spend less time, than by the alternative system of comparing the map with the ground piece by piece and object by object by looking from one to the other.

Section 63.—Finding Position of Reader on Map

1. The following instructions will guide men in finding out their exact position, when they are uncertain of it in any tract of country, with the aid of a map and compass. The man must first make certain of the position of two known points both upon the landscape and in the map. He must then set his map. He must next take compass bearings (Section 58, para. 8) of these two known points in the landscape. Having done this, he must draw a line in pencil across the map through each point towards him, the lines being at the correct angle for the bearing measured for each point. The point at which these two lines meet

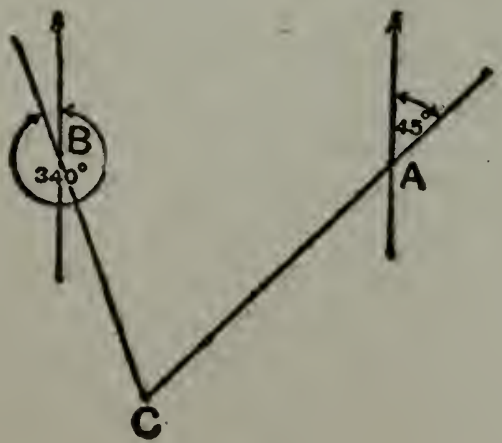


FIG. 12.

on the map will indicate to him his exact position on the actual ground.

2. For example, he takes two points called A and B, which can be identified both in the landscape and on the map, as shown in Fig. 12. By following the above directions he ascertains that the bearing of A is 45° and the bearing of B is 340°. He then draws lines through A and B on the map at the correct angles, according to the above bearings, towards himself. These lines meet on the map at the point C, also indicated in the illustration. The point C therefore will indicate his exact position on the actual ground as shown in the map.

Section 64.—Section Drawing

1. **Use and Definition.**—Section drawing will enable signallers to reproduce from a map the form of any particular line of country which lies between any two points in any section of it. Ability to do this may be useful in case of doubt as regards one point in a section of country being visible from another point.

2. A section of a portion of country is the outline of the surface of the ground that would be exposed to view after cutting it vertically down along a given straight line and removing one side of it. The usual illustration given is that of a loaf of bread cut in half from top to bottom. The outline seen when one half of the loaf is removed is a life-size section of the loaf, but in drawing sections on a map or plan the scale has to be taken into account, since the section must be drawn to scale.

3. On very large scale maps or plans it might be possible to show the vertical heights on the same scale as that used for the horizontal distances. This would be a true section. It is usual, however, to exaggerate the heights in some proportion to the horizontal scale, for the reason that the heights, if drawn to the same scale as the map, would be often inappreciable. This will be understood by considering, for example, the scale of the 6-inch map.

4. **Instructions.**—Suppose it were required to draw a section of the country represented by a portion of the 6-inch map, which has been contoured at 20 feet vertical intervals. It would be necessary to show measurements of 20 feet. But 20 feet on a scale of 6 inches to 1 mile is represented by 1/44 of an inch and of course it would be quite impossible to rule parallel lines at this minute distance apart. In drawing a section on such a map, therefore, it is necessary to exaggerate the heights about four times. Whatever exaggeration is adopted, its multiple should be clearly stated on the drawing, *e.g.* heights to distances as 4 to 1; or more usually H : D : : 4 : 1.

5. An example of a section is shown in the accompanying plate. Here the scale of the map is 2 inches to 1 mile and the vertical interval between contours is 25 feet. Assuming, for example, that it is necessary to draw a section of the country from A to B, the following method must be employed. Lay the edge of a piece of paper against the line AB, and mark on the paper the exact spot where each contour line and each watercourse crosses the line AB. Also on the paper write against each contour mark so made its height as given in the plan. Then rule a straight line on the drawing-paper, apply to it the edge of the paper marked and noted as above described, and transfer to the straight line all the marks and figures, including the points A and B. The straight line is the starting or datum level of the section. From each mark made along it raise a perpendicular of about one inch in length.

6. **Heights and Contours.**—This being done, it is necessary to consider what exaggeration it will be advisable to give to the heights of the contours. In the example given, the vertical interval is 25 feet, and 25 feet on the scale of 2 inches to 1 mile is hardly appreciable. The exaggeration should therefore be a multiplication of six times, which in the case in point gives a measurement of about 1/18 of an inch between the parallel lines—a small but practicable distance. The exaggeration of the heights must be noted clearly

above the map of the section as follows, H : D : : 6 : 1, as shown in the illustration.

7. The next step is to rule on the drawing-paper parallel to the datum line at intervals of six times 25 feet (= 50 yards) measured off the plan scale, as many straight lines as there are contour intervals each of these lines cutting the series of perpendiculars previously drawn, in the manner shown in the illustration: Now the datum line represents the lowest contour which comes into the section, and must be marked accordingly; the next parallel line above it represents a contour 25 feet above it; and so on. In the example given the lowest contour which comes into the section is 175, and the datum line must therefore be marked 175, the next parallel line 200, and the next 225, and so on, as illustrated.

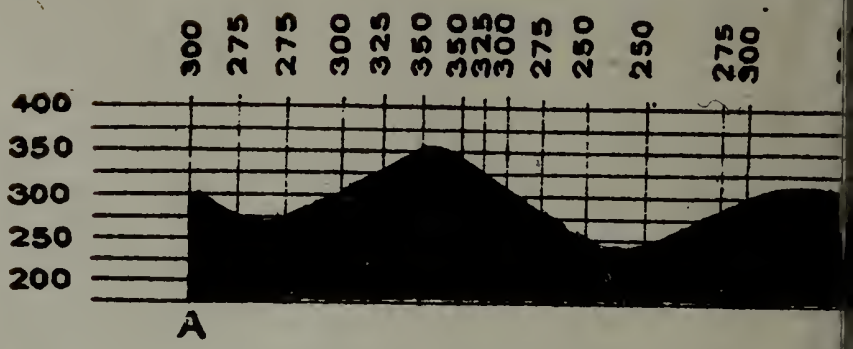
8. When the proper number of each parallel or horizontal line and each perpendicular or vertical line is written against it, the rise and fall of the contours may be outlined in the following manner: Commence, for example at the end of the datum line marked in the illustration. The perpendicular raised from A is marked 300. Follow it upward till it cuts the parallel figured 300, and put a pencil mark at the point of intersection of the two lines.

9. In a similar manner deal with each perpendicular, marking the point where it cuts the parallel line having a corresponding figure. Wherever two adjacent perpendiculars have the same figure, the ground between them must either rise or fall slightly, and by looking at the plan the amount of this rise or fall can easily be judged and marked on the section.

10. Finally, join up by a continuous line all the points of intersection thus obtained, and the result is an outline of the section showing the rise and fall of the ground and the height of its contours. Practice in section drawing assists men in understanding the inequalities of the ground represented on the map, and after drawing a few sections it can be seen quickly how the country rises and falls between one point and another.

REPRESENTATION

SECTION ON A



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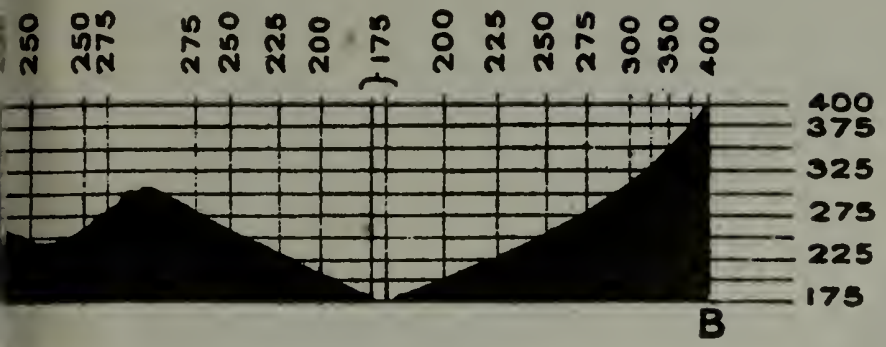

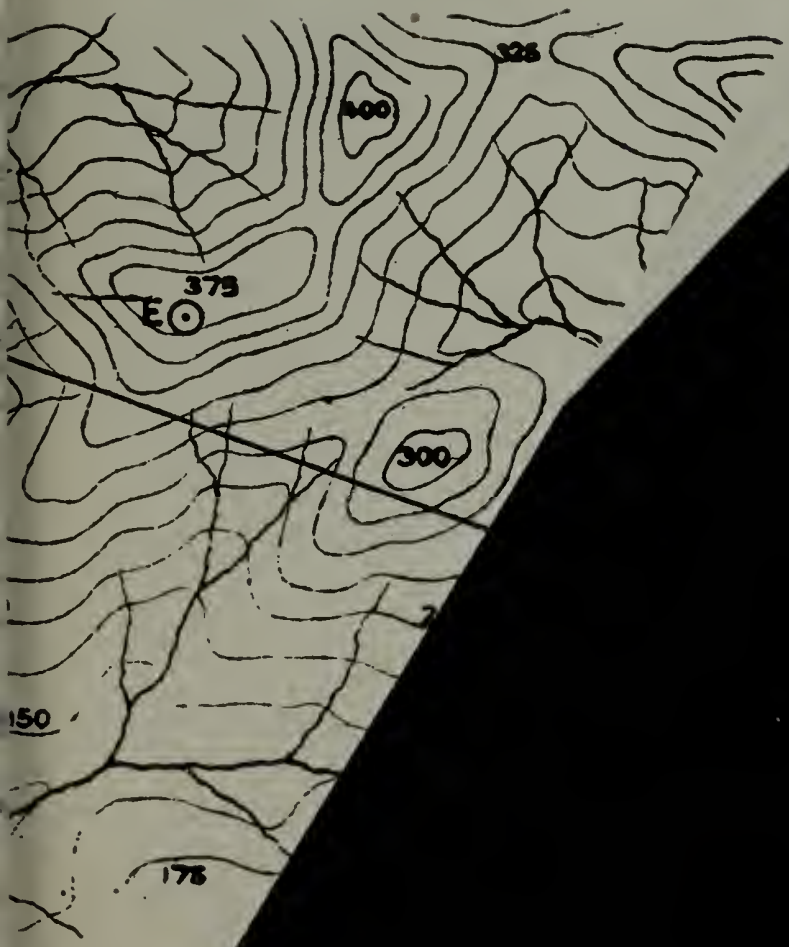

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Section 65.—Mutual Visibility of Points

1. The following rules regarding the mutual visibility of points are useful to signallers in selecting points of vantage in a country, as it enables them to make certain that any two points are visible from one another and not hidden by a part of the intervening ground or any objects upon it, in which case, of course, they would be useless for the purpose of sending flag or flash Morse or Semaphore, signals from one to the other.

2. To ascertain whether one point on a map is visible from another, the contours between them must be examined carefully, and anything with a straight edge, such as a pocket rule, must be placed on the map between the two points under consideration. One of the three following contingencies will then decide the question:

(*a*) If this straightedge passes across no intervening contours of a greater height than the points under consideration, it is certain that they are visible from one another.

(*b*) If the straight edge passes across any intervening contour of a greater height than both points, it is certain that they are invisible from one another.

(*c*) If the straight edge passes across any contour of a greater height than one of the two points and a lesser height than the other, a doubt as to visibility occurs.

3. In the case of (*c*) the question then arises whether this intervening feature of the country will block the view between the two points, and the answer depends upon whether the slope between the two points is concave or convex. In the former case the points will be visible from one another; in the latter they will be invisible from one another. These doubtful cases can as a rule be settled quickly by a practised eye. And they can be settled in two ways—either by drawing a section, as explained in the preceding paragraphs, or by working out a small proportion sum.

4. For instance, referring to the plate facing page 195, it is desired to know if a man at the point A can signal to a

man at the point B. The respective heights of the men and flags may be disregarded for the purpose of calculation. The ground at D is found to be 50 feet higher than at A, though it is 50 feet lower than at B. Will this block out the view? Having drawn the section, a straight edge must be laid across the map from the point B, the height of which is marked 400 on the section, to the point A, the height of which is marked as 300, and it is found that ground at the point D—the height of which is marked as 350—intervenes between them. Therefore it is clear that the point A will not be visible from the point B.

5. To solve this question even more quickly by working out a proportion sum, the distance from A to the point where the line AB cuts the intervening contour D must be measured with the aid of the scale of the map. This distance is found to be 600 yards. The distance from the point A to the point B is found in a similar manner to be 3350 yards. Now the point D is 50 feet higher than the point A. Therefore a line of sight from A which shall clear the point D must rise at least 50 feet in a distance of 600 yards. How high will this line of sight rise if it continues at the same rate, *i.e.* 50 yards, in 600 yards over a distance of 3,350 yards—namely, the distance from A to B?

6. The answer to the question can be found by working out the following proportion sum:

$$600 : 3{,}350 : : 50 : X.$$

$$\frac{3{,}350 \times 50}{600} = X.$$

Answer, X = 279 feet (approximately).

Therefore a line of sight from A will clear D, which will, if it continues rising at the same rate, have risen to a height of 279 feet above A when it has spanned the distance between A and the more distant point at B. The point B, however, is only 100 feet higher than A. Therefore A and

B must be quite invisible from one another, the slope between them being convex. In a similar manner, it can be proved that the point A is invisible from the point E, and the point D from the point C.

7. In the above calculations, intervening trees, buildings, and other features for which allowances must be made in considering the visibility of points have not been taken into account.

CHAPTER V

CABLE TELEPHONE DRILL

Section 66.—General Instructions for Laying Field Cable Telephones

1. **Service Cables in Use.**

Name.	Description.	Diameter.	Weight	Resistance.
			Lbs. per mile	Ohms per mile.
D 1.....	Steel wire, 7 strands, tape covered, black braid	.09"	22½	1,060
D 3.....	Steel wire, 12 strands, rubber-covered, red braid	.1"	40	500
D 5, Mk.IV.	Steel wire, 19 strands, rubber-covered, black braid.....	.145"	80	63

2. **Successful Communication.**—The following paragraphs describe the general principles of laying and maintaining lines of field cable. (i) Successful communication depends on the combination of:

Good lines; good instruments; well-trained operators; good office organization. If the communication is unsatisfactory, the cause must be sought for till found, and corrected. The service equipment will give excellent results if it is correctly used.

(ii) **Good Lines.**—A good line is one that is not likely to be broken, well insulated and kept clear of other lines. These objects are secured by:—

Safety.—Placing the line out of the way of all traffic which may come along by day or night, including troops moving at night as reliefs to the trenches. It should be raised high up on trees, hedges, houses, or poles obtained locally. A line raised on poles is less liable to injury by shell fire than one which is lying on the ground. When near the firing line, considerations of the safety of the line, and of the men laying and maintaining it, are the main considerations; the line should be laid where concealment can be obtained.

If the line can only be repaired at night then it is probably best laid on the ground so that the lineman can run it through his hand. Over places which are specially fire-swept, and where lines are continually cut, two or three lines 20 yards apart may have to be run and the ends bunched to single line again. For considerations of amount of cable laid out and confusion of lines at the end of the exposed area, the less of this that is done the better.

Buried cable over fire-swept zones has been found effective. To be reliable it must be carefully laid in a trench about two feet deep and protected where it crosses ditches by piping or trunks of trees. Numerous places for testing for faults in the buried cables must be established along the route. Ammunition boxes bored to allow the cable to pass from side to side have been found suitable. The cable should not be stripped of insulation at the boxes, contact for test being made with a pin.

(iii) **Insulation.**—Good insulation is obtained by raising the line off the ground, or, where necessarily on the ground, by keeping it out of the wet as much as possible. Tying the cable itself round iron spikes, eaves gutters, or any other iron is certain to cut the insulation and make a ground. The attachment should be made by spun yarn or twine, and all rubbing of cable against sharp corners avoided.

(iv) **Induction.**—Lines laid close alongside one another for any distance "induce" the signals from one to the

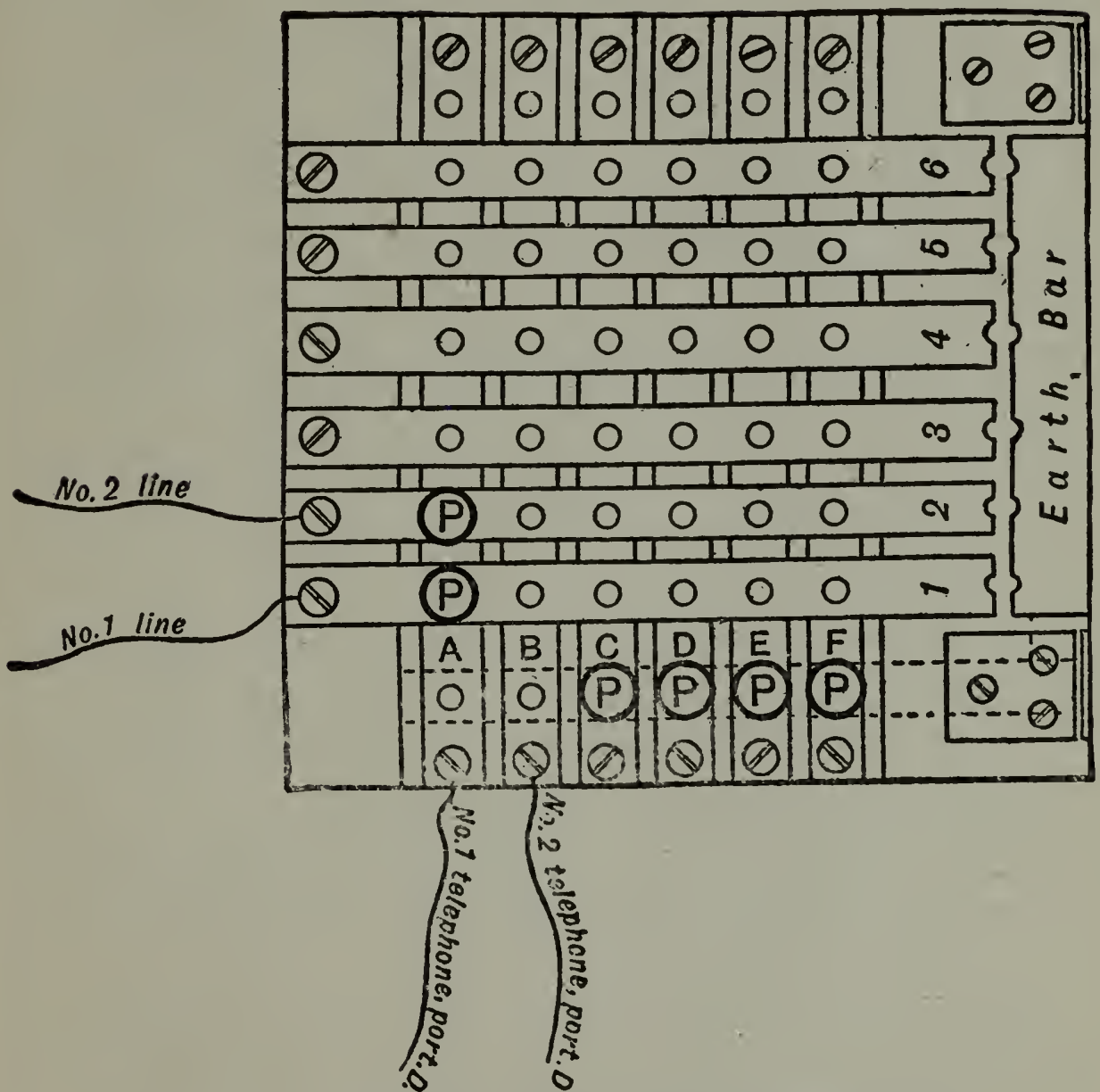
other, and so interfere with good working. Therefore lines must be kept well separated, wherever possible, by several yards.

(v) **Maintenance.**—This is most important. By constant patrolling and work by a lineman a line, which in the first instance may have been laid indifferently, should be strengthened and rendered secure. Every line should be gone through by a lineman at least once in the twenty-four hours, and defects put right. An officer should constantly go through the lines and see their condition. To know when a line is faulty is a matter of office organization. Its rapid repair depends on linemen being ready to go out at short notice, and a good understanding of what the lineman from the other end will do. It is absolutely essential that every line be marked throughout its course so that the lineman shall recognize the line by day or night. This marking can be done by wooden tabs of different shapes or by colored strips of tape or cloth tied to the cables. In each Division there should be recognized marks for Artillery, Battery and Brigade lines, for Signal Service lines, and for Infantry Brigade lines. A neat and tidy system of leading in each line at offices so that each can be identified is very necessary. Every lineman must carry pliers, knife, and insulating tape.

(vi) **Well-Trained Operators.**—The greater the accuracy with which operators can send and receive signals on the buzzer the better. Operators unable to transit messages by key must transmit by speech. For this a good deal of practice is required, and for spelling out doubtful words the signallers' alphabet will be required. Direct speech between the officers concerned is generally better than for them to hand in written messages. For this purpose there should be an instrument in the Headquarters Office which can be put through to any required office.

Operators must at once report any cessation, difficulty or delay in getting messages through, so that steps may be taken to improve matters. This information must be at once given to the Staff concerned.

CABLE TELEPHONE COMMUTATOR



CABLE TELEPHONE COMMUTATOR.

(vii) **Good Office Organization.**—Operators should work under the best available conditions. The following are points to be attended to:—

(*a*) Instruments and leads neatly arranged, labelled, well connected, and conveniently placed on tables.

(*b*) The instrument room to be adjacent to the Headquarters Office—operators to be made as physically comfortable as possible. Good light important.

(*c*) Men to be billeted close by, so that extra operators can be quickly turned out, or those not required sent to rest.

(*d*) Accommodations for the cyclists and messengers.

(viii) **Field Lines.**—On field lines it may be expected that faults will be frequent and the organization to remove them rapidly must be good.

(*a*) The lines must be tested to be in good working order at short intervals.

(*b*) The tests to prove that the fault is not in the office itself must be promptly made.

(*c*) The linemen, properly equipped to repair a fault, must be ready to start at any time, day or night.

(*d*) The lineman must know exactly what has been arranged with the lineman from the far office, and what tests he is to make to locate the fault.

(*e*) The alternative methods to transmit messages in case of a fault, such as by despatch rider, or through some alternative route thought out, known to all concerned, and promptly put in action.

3. **Pace.**—The pace at which a telephone line can be laid out depends on the country; but the two main principles to be borne in mind are:—

(i) Rapidity in laying.
(ii) Safety of the line.

4. **Laying Cables.**—It is impossible to lay down fixed rules as to where the cable is to be laid, as this must necessarily be governed by local conditions, and must be left to

the common-sense of the detachment; but the following points are laid down for guidance. As a general rule the further the cable is laid from *metalled roads,* where much traffic may pass, the better; even the *grass margin* of such roads is not safe from men or vehicles.

5. The paying-out should be regulated so that the cable lies throughout evenly on the ground. If it be stretched across a *hollow in the ground,* or caught on an *isolated bush,* there is a danger that a person crossing it may trip up, and either break it or drag it out of place. *The cable should be stretched out without any strain on it, but also without leaving loops or coils.*

6. It should never be stretched off the ground across *gates* or *gaps in* hedges, through which men or animals may pass, or in any position where it would interfere with traffic. If a *thick hedge* or a *fence* borders the road, it is a good thing to loop up the cable along it; this is especially advisable in wet weather. In this case the cable must always be brought to the ground at any gap or gate, and should, if necessary, be tied down on either side. *When looping the cable in this manner, care must be taken that it is not at such a height that it will be liable to catch in the axles or tilts of vehicles moving at the side of the road.*

7. The cable should be laid out of sight if possible. It should *never be laid in water.* If laid across an *open space,* the cable should be just stretched on the ground, and pegged down at every half-mile. When the line follows a *sandy track* through bush or heather, it is best to lay the cable flat in the track.

8. In laying cable in front of *dwelling-houses,* it may be allowed to lie on the ground, but should then be laid fairly tight, quite flat, and pegged down on either side of the door or gate, or close to the rise of steps. *The only safe position for cables passing through large villages or towns is when fastened high up on the buildings.* This entails slow progress and in peace may require the consent of the inhabitants. If speed is of great importance, risks must be taken,

and the cable should then be laid in the *gutter* and tied down frequently to the *gratings of the drains.*

9. *When two cables have to follow the same route, they should be laid as far apart as possible to reduce the magnetic induction* from one to the other, which causes interference and overheating. When cable lines cross *roads* or *tracks,* the cable should be stretched at least 15 feet above the roadway, or buried. *A bury crossing* should be resorted to only on soft and unmetalled tracks, as the cable is liable to damage and to produce earth faults in wet weather. *An air crossing* will only be possible if there is a tree, telegraph pole, or building on either side of the road where the crossing is to be made. If neither air nor bury crossings are possible, resource may be had to a long tube of hard rubber, which is split spirally. The cable, thus covered, can be laid on the surface of the road and is not harmed by traffic. A few of such lengths of tubing form part of the equipment of each brigade section.

10. **Fastening Cables to Buildings, etc.**—The best way of making cable fast to a *building, tree, fence,* or any other holdfast, is to make a barrel hitch with a piece of spun yarn through a loop or coil of the cable, and to tie off the ends of the spun yarn to the holdfast. Occasionally it may be found more convenient to make a close hitch, or a round turn and two half-hitches, with a bight of the cable round the holdfast. If this be done, care must be taken to see that the end of the bight is secured, so that the spring of the steel in the cable will not cause the clove hitch to become slack. *The cable itself should never be tied round an iron holdfast.*

11. If it be found impossible to reach the spot where the cable should be tied, it should be hooked over a projection by means of the jointed crookstick, and made off taut at the base of the holdfast. It is frequently desirable and often necessary to tie back the cable to gates, hedges, and fences at the side of the road. This is especially necessary when the cable follows the outside of a curve in the road, where

it is liable to be dragged across the roadway if any strain comes on it. The cable should be tied back as near the ground as possible.

Section 67.—Care of Cables

The first essential in laying a line of cable is that the metal conductor must be continuous; there must be no break in the cable, and all joints, if not permanent, must be pinched up tight with pliers. The insulation must be good, otherwise, although there may be no break, any bare wire touching a conductor, such as a tree or the ground, will cause a great leakage of current, which may seriously interfere with the signals. Empty drums should not be left lying about in the sun.

Section 68.—Temporary Joints

1. When a temporary joint has to be made in a piece of cable in the field, as at the end of a drum, or where a break has occurred, the insulation will be stripped off the cable for about 3 inches from a point 1 inch from the end. A piece of indiarubber tubing 5 or 6 inches long will then be slipped on to one of the ends, and the ends will be tied together by a reef knot in the bared portion. This knot will be drawn as tight as possible to insure a good contact, and the tubing will then be drawn over it to insulate the joint. If the joint is at the end of a drum, the ends of the cable should be already prepared as above described, and the rubber tubing will not be necessary. One cable will be threaded through the empty drum; the joint will be made and drawn into the drum. The cable on each side of the drum will then be wound four or five times round the drum to prevent any strain on the cable coming on the joint, and the drum will then be left resting on its flanges at the side of the road.

2. The short length of insulation left at each end of the cable prevents the strands from coming untwisted.

3. Some cable is issued with a cable coupler at each end, and it is only necessary, in making a joint to clip the two

portions together and then tie a thumb knot in a bight of the cable, with the coupler in the bight. This prevents any strain on the cable from breaking contact at the coupler.

Section 69.—Semi-Permanent Joints in the Field

1. If it is unlikely for some time that there will be an opportunity for running through the cable and making permanent joints, it may be desirable to make a semi-permanent joint, if the cable is broken. To do this, clean the ends of the cable carefully with sandpaper, and then proceed as for a temporary joint. Pinch the reef knot up tight with pliers, and cut the loose ends off close; smear the joint with rubber solution and bind it with indiarubber tape, taking care that the latter overlaps the insulation on either side of the joint.

2. Bared insulation is repaired by smearing the place with rubber solution and binding with indiarubber tape, as described above.

Section 70.—Permanent Joints

1. Every opportunity should be taken for running through the drums of cable which has been in use, in order to repair the insulation, and to make temporary and semi-permanent joints permanent.

2. To make a permanent joint, remove about 3 inches of insulation, and clean the ends of wire carefully, untwisting the strands so as to get at every part. Tie the bared ends in a reef knot; pull the knot tight and pinch it with pliers; cut off loose ends and bind the tails of the knot with a piece of copper wire, which should be inserted in the reef knot before it is pulled up tight. The ends of the wire are wound round the knot in opposite directions from its center. Then solder the joint as follows:—Heat the soldering iron and clean a portion of the surface so as to allow the solder to run freely on the iron. Apply some of the flux (zinc chloride solution) to the joint and then melt some solder

on the cleaned portion of the iron. Dip the joint into the liquid solder until a sufficient quantity has been absorbed, and then wipe it with a rag. Wash the joint with water to remove the remains of the flux, dry and serve with india-rubber solution and tape, being careful to make the latter overlap the original insulation by half an inch on each side.

Section 71.—Earths

1. One terminal of each telephone in a circuit is connected to an earth pin by means of a short length of wire. The pin should be placed in damp ground, or, if the ground is very dry water should be poured round it to improve the contact. The pin, or a blade of a knife with the bared cable wound tightly round it, may be stuck into a living tree, which forms a good earth.

2. If several telephones are in use at one place on different circuits, the earth pins should be as far apart as possible (5 or 10 yards at least) to prevent interference by induction.

3. If neither pin nor knife is available, the earth connection may be made fast to a gutter grating, lamp-post, etc.

4. To keep communication with the base office, while actually laying cable, a heel plate is provided for use as follows: The driver, who leads the pack animal, should be provided with a telephone, the receiver of which he should keep strapped to his ear. He should wear the heel plate, which should be connected by a length of lead to one terminal of the telephone. The other terminal should be connected by a length of wire to the terminal on the standard of the pack saddle, and thence to the inner end of the cable on the drum. Every time the driver puts his foot to ground he completes the circuit, and can hear if he is being called up.

If a heel plate is not available, it will be found that nearly the same effect can be obtained by connecting one terminal of the telephone to the earth-pin, and giving it to the driver to hold in his hand.

Section 72.—More Than Two Telephones in Circuit

1. If a third telephone is to be added to a circuit. it should be joined up in leak; that is to say, a portion of the cable should be bared and connected to one terminal; the other terminal should be connected to earth. This saves cutting the cable, which would otherwise cause an interruption in the communication between the other telephones.

2. A fairly good connection can be made with the cable by sticking a pin right through the insulation and strands of the cable and making off a lead to the pin. This saves the insulation very considerably.

Section 73.—General Instructions Regarding the Use of Telephones

1. When communication is interrupted each operator will:—

(i) Report to the N.C.O. in charge of station.
(ii) Carefully test his own instrument and connections.
(iii) Endeavor to call up the distant station with repeated calls.

If, after an interval of five minutes, communication has not been restored, the N.C.O. or senior soldier at the station will report to the headquarters of the unit with which he is working and will send a man along the line to discover and repair the fault. Thus a man should start simultaneously from each end of the line, and walk along it until he meets the man from the other end, or until communication is restored.

2. The lineman will take with him a telephone, if available, and will first tap in just outside his station to make certain that the fault is not in the telephone. He will then pass the cable through his hand, and if he finds a break, or bare wire, will repair it. Having done this, he will again tap in to hear if communication has been restored. At each drum the lineman will tap in to make sure that he has not

passed the fault. When the line has been repaired, the lineman must call up each station and find out whether they are again in communication. It must be remembered that the line may be cut in several places, and that it is not necessarily sufficient to repair one fault.

Section 74.—Instructions for the Transmission of Written Messages in the Field

1. Although the telephone, portable, "D" was originally intended for the transmission of messages by word or mouth, it will be found in many cases quicker and more accurate to send them on the vibrator. This is especially the case with the "D" Mk. III telephone, which is fitted with a key. The message in this case will be treated in exactly the same manner as when using visual signalling, and requires no further explanation.

2. When a message is transmitted verbally the following procedure should be adhered to:—

Sending	Receiving
(i) Call up distant station by pressing vibrator push piece.	On hearing a call, reply in the same manner.
(ii) On hearing answering call, say "Message for" and name the unit as shown in the address.	Get ready pencil and paper and say "Go on."
(iii) Dictate the message slowly, three or four words at a time, selecting the groups of words according to the sense of the message.	Write down the message as dictated, repeating each word as you write it down. Do not repeat the last word until you have written it down.
(iv) Spell out all names of persons and places and all words written in capitals.	Write down the words in block capitals and repeat the spelling.

Sending	Receiving
(v) Transmit figures thus: 10066 "Figures — one double o double 6, ten thousand and sixty-six."	Write down the figures as you receive them, and check back in the same manner.
(vi) When you have finished the message, say "Message ends."	Repeat the whole message.
(vii) When the message has been correctly repeated, say "Correct," and if you have no other message say "Good-bye."	Say "Good-bye."

3. When words are spelt on the telephone, the signalling names for letters (beer, pip, toc, etc.) must be used. Care must be taken not to shout into the telephone; the natural pitch of the voice is quite sufficient, but talking must be clear, distinct, and slow.

4. When a message cannot be sent promptly owing to breakdown or press of work, the N.C.O. or base operator will at once inform the addressor.

5. When a message has to be sent at the same time to more than one station on the same line, no answers will be given during the message. At the end of the message the office nearest the office of origin will ask for corrections, then repeat the whole message and give RD and its station call; then the next nearest station will ask for any further corrections it may require, and will do likewise. This procedure will continue until all stations concerned have sent RD.

Section 75.—Infantry Brigade Telephone Equipment and Drill

1. An Infantry Brigade Telephone section consists of:—

(i) Two detachments, each of: 1 N.C.O. and 4 men, 1 pack animal and driver.

(ii) One cart, with driver and pair of horses.

2. Each pack saddle is fitted to take six drums, five of these carrying half-a-mile of cable each, and the other being an empty drum. The remaining equipment, namely, one mattock, two crooksticks, six earth pins, and two wallets, with materials for repairs and small stores may also be carried on the pack saddle; but when the detachment is working, the crooksticks and four of the earth pins will be carried by the men.

3. The cart carries spare stores, including four miles of cable, signalling stores, and a commutator; the latter must be readily accessible. The cart may also be used to carry the mens' arms, equipment, and food.

4. Each N.C.O. and man of a detachment, except the driver, carries a pair of pliers, a clasp knife, some lengths of spun yarn, and a supply of safety pins. The N.C.O., Nos. 1 and 3, and the driver each carry one telephone, portable, "D," with earth pin attached to one terminal by a long lead and carried under the straps.

5. Every man in the section must have a thorough knowledge of map reading, and must know how to find his way by day or by night. Laying the cable in a safe position is of the first importance, but this must be combined with rapidity. For this reason thorough training is required, and each man of a detachment should be able to take any number.

6. The N.C.O. in charge of detachment is responsible for the efficiency of his detachment, as well as for the condition of the equipment.

Section 76.—To Lay a Single Line

1. On the command "Fall in," from the N.C.O. in charge of detachment, the men of the detachment will fall in in single rank behind the pack animal. The N.C.O. ascertains that the equipment on the pack saddle and on the men is complete and in working order; he then gives the command "Tell off" and the men number from right to left.

2. On receipt of orders as to what work has to be performed, where and in what direction the lines has to be laid, and how much cable will be required, the N.C.O. gives the command "Commence work," when:—

No. 1, who is base operator, takes the end of the cable from *No.* 2, and connects the cable to the free terminal of his telephone, portable, "D." He inserts the earth pin in the ground.

No. 2 puts on leather gloves, unrolls about 5 yards of cable from a drum, and hands the end to *No.* 1.

No. 3 takes the crookstick from the saddle and then ties a bight of the cable to some natural holdfast, if one be available, to prevent any strain on the cable reaching the instrument.

No. 4 takes a second crookstick and prepares to assist to lay the cable.

The driver connects one terminal of his telephone "D," Mk. II, by a long lead to the terminal of the drum of cable in use; the other terminal is joined to a heel plate, or to an earth pin, which he sticks in the ground. He exchanges calls with *No.* 1, thus testing telephones and cable. He reports to the N.C.O. when the signals are satisfactory.

3. It is necessary that the driver is taught sufficient buzzer reading for him to recognize his own call sent slowly.

4. *The N.C.O.* superintends, and is responsible that the detachment gets to the right place; he should carry a map and compass.

5. When all is ready the N.C.O. gives the command "Quick March." On this command:—

No. 1 wraps part of the slack of the cable round his foot, if it has not already been made off to a holdfast.

No. 2 walks behind the pack animal and guides the cable off the drum, to prevent it getting caught in the winding gear.

No. 3 places the cable on the crookstick and follows the pack animal at a distance varying according to circumstances, but not less than 20 yards. He is responsible for laying the cable in a safe position.

No. 4 assists generally and lays the cable if *No.* 3 is far behind. On seeing that the cable must cross a road, he calls out "bury crossing" or "tree crossing"; or, if neither of these be possible, "tube crossing."

In the case of a bury crossing *No.* 4 takes the mattock and picks a shallow trench through the surface of the road, sufficiently deep to entirely bury the cable. *No.* 2 then pays out enough loose cable to make the crossing and leave a few yards spare. There is no need to halt the pack animal.

The driver keeps the receiver of the telephone strapped to his ear, and, if he has not got a heel plate, carries the earth pin, already connected to the telephone, in his hand. By this means he is able to tell, even while on the move, whether he is being called up. If he is called up by a long buzz, he knows that *No.* 1 is testing the line, and answers accordingly. If, however, *No.* 1 wishes to send a message, he calls up with a series of dashes; on which the driver halts the pack animal, and hands the receiver to *No.* 2. The driver must always exchange signals with the base whenever the pack animal is halted.

The N.C.O. superintends and directs the detachment, and assists at crossings. He places the cable in the trench of a bury crossing, covers it up, and ties back, assisted by *No.* 3, if the latter is available.

If *No.* 4 considers that a tree crossing is feasible, he will, with the assistance of the N.C.O., climb the trees or poles, and make fast the cable. If the trees are unclimbable, he will hook up the cable with his crookstick. *No.* 3 assists, if near the detachment. The *N.C.O.* ties back the cable at the foot of each side of the crossing. In the meantime *No.* 2 pays out sufficient slack to make the crossing and the necessary knots.

Near the completion of a drum, *No.* 2 calls out "New Drum," and the driver halts the pack animal. *No.* 2 takes the empty drum off the standards and puts a new one in its place. He makes the joint in the cable, as previously described, and leaves the drum at the side of the road and, if possible, out of sight. He is assisted by *No.* 4.

6. On arrival at the distant station or objective, the driver gives his telephone to *No. 2*, who is the operator.

No. 2 calls up the base to ascertain that the line is through and to report arrival.

No. 3 is the lineman, and is sent out if any fault occurs on the line.

The driver unloads and attends to his pack animal.

The N.C.O. informs the senior officer of his arrival, and asks him where to place the terminal.

If the station is likely to be in a fixed position for some time, the detachment should be told off in reliefs, and the pack animal may be off-saddled. At every halt the side boards, or drums, must be taken off the pack animal.

7. The line when once laid requires careful attention to keep it in an efficient state. If required for more than a few hours it must be patrolled at least once a day by men detailed for the purpose. These men are known as "linemen." The lineman must visually inspect the whole line, repair any fault, and refix the cable if displaced. Particular attention should be paid to crossings to insure that they are secure.

Section 77.—To Lay Two or More Lines at the Same Time from One Base

1. If it is necessary to lay two lines from one base, each detachment details a base operator. The commutator is taken from the cart and opened. The base operators attach the line cables to separate numbered terminals on the commutator, and their telephones by leads to separate lettered terminals, and to separate earth pins; these latter should be placed well apart (see Fig. 13). The operators connect, by means of plugs, both lines to one telephone, reserving the other telephone for pressure of work. One man takes duty as operator, and the other acts as base lineman; they relieve each other at intervals.

2. If a third line is required, the detachment must do without a *No. 4*, and the two men thus left take a drum on

the carrier bar and lay the line by hand. The commutator is used as before, only in this case there is likely to be a shortage of base operators, and one man may have to work the three stations.

3. If two out-stations wish to communicate direct with one another, they can be joined through on the commutator by plugging the two numbered bars concerned to the same lettered one. The base operator must tap in every now and then to find out if they have finished, and wish to be cut off.

Section 78.—Reeling Up

1. Reeling up the cable is far the most arduous work that the section will have to perform, and to do it efficiently requires that the whole detachment work well together.

2. On the intimation that the cable can be reeled up, the *N.C.O.* in charge of the station, or the operator who receives the message, gives the command "Load Up." The driver then saddles the pack animal and the operator informs the base that he is about to disconnect and reel up.

3. On the command "Commence Work":—

No. 4 "stands to" the handle of the winding gear, and the drum is placed on the standards.

No. 3. takes the crookstick, places the cable on it, and follows the pack animal at a distance of 10 to 20 yards.

Nos. 3 and 4 relieve each other.

No. 2 moves in advance of the detachment and "clears" the line. making it easy to pick up.

The *N.C.O.* superintends the work, and clears any crossing that *No.* 2 has left.

4. It may sometimes be found more convenient for *Nos.* 3 *and* 4 to reel up the cable by hand, by means of the carrier bar.

5. If it is necessary to pick up more than two lines of cable at the same time, the base operator must assist the operators at one of the distant stations to reel up by hand.